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Music and Communication:
a study of young children's original melodies

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ABSTRACT: "Music and Communication: a study of young children's original melodies".

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Earlier research (LEGGATT 1974) suggested that young children can communicate moods through original melodies. The present research examines the discriminating effect on mood communication of the components pitch, rhythm and speed. Age, sex, aural disembedding, perception, personality and ambiguity were considered.

The hypotheses adopted were:

1.(i). Junior children can communicate through perceived moods in original melodies.
(ii). This communication is made by virtue of one or more components.
2. Communication is dependent on Personality.
3. Communication is dependent on the ability to disembed.
4. Children like ambiguous tunes more than they like unambiguous tunes.

Five moods identified as "Angry, comical, dreamy, frightened and sad" were chosen. The experimental method required each composer to produce, in random order on different days, five melodies each evocative of a stated mood. Each tune was recorded on magnetic tape so that listeners could have identical renditions. Each tune was then modified by subtracting successively pitch and rhythm. A third modification was altered speed. Tunes were assessed again for mood categorization; a sample was also assessed for preference of ambiguity or unambiguity.

The results after computer and manual analysis suggest:

1. Removal of a musical component alters original mood perception and may cause clustering of mood perceptions.
2. There is a connection between type of musical component perceived and mood.
3. Children's preference for ambiguous or unambiguous tunes is influenced by perceived mood of tune.
4. Sex, age, personality and aural disembedding ability do not significantly affect categorizations of original or modified tunes.

The general implications are:

1. In children's own tunes, perceived mood varies as components perceived.
2. The effect of certain components on mood perception may be more readily discernible than others.
3. It is likely that a consensus exists amongst children regarding the embodiment of tunes.
4. Young children seem to sense bonding characteristics between certain moods embodied in tunes.

C O N T E N T S

Appendix.

Tables:

Those not listed below appear within the chapters to which they apply.

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CHAPTER ONE

Statement of Procedure

I. Preamble

This research is a sequel to an earlier enquiry (LEGGATT, 1974) which stated in the Abstract:

> "The research investigated the premise that communication of mood is possible between children and between children and adults. The art chosen for the communication was music."

From the findings of that research it was suggested that:

> "1. The pupils of the sample used were able to communicate simple moods through the music which they themselves had composed.
>
> 2. The success with which moods could be communicated varied between different moods. Additionally, instruction of tune generators enabled them to secure a statistically significant increase in the number of moods successfully categorized ....."

Within the quoted sections numbered one and two above are two important matters which bear on the present research; it will be noted that all the music which had been used was original and composed by some of the children in the sample.

It was felt essential then, as it is now in this enquiry, to use music which for them was entirely new and which could be claimed to be each composer's personal statement, the product of each creative intellect, than to use music which was the product of someone else's creativity. Indeed, DAVIES (1971) said:

> "Unfortunately, it is impossible to assess exactly just how much or how little contamination ..... takes place ..... due to the experiential influences mentioned ....."

In the present research, as well as in the previous one, there may well be some element of novelty, as it seems to have been standard practice in many earlier pieces of enquiry to use works of the standard repertory for experiments having an affective background. As material for experiments in musical taste, MYERS (1922) used, for example, Beethoven's "Egmont" Overture op. 84, Tchaikowsky's "Valse des Fleurs" in op. 71a and Mendlessohn's "Fingal's Cave" Overture op. 26. HEINLEIN (1928) investigating modes, used amongst other items a Dvorak Symphony, Grieg's "Anitra's Dance", Handel's "Largo from Xerxes" and the Intermezzo from Massanet's "Thais". HEVNER (1936) investigating rhythm used works of great composers, while HEVNER (1937), in her work on pitch and tempo, used standard works such as some Beethoven Variations, a Chopin nocturne and a Bach sarabande. VALENTINE (1962) writes that in his

preliminary experiments, he played on the piano "selections" from the music of Beethoven, Schubert and Mendlessohn. Other examples could be quoted including those in work by ORTMANN (1937) and LUNDIN (1967).

The present investigator considered this approach not suitable to his research, since it was felt that gross distortion of response by listeners could result, such effect possibly being the result of conditioning and of social acceptance of how one should react to music. Indeed, WING (1968) wrote concerning the use of recordings in some tests of musical appreciation:

> "..... if any record happened to be known it was immediately preferred, irrespective of its musical merits."

With reference to the latter part of the quoted section two at the beginning of this chapter, a brief recapitulation of what was done in the previous research will be relevant to an understanding of this enquiry. The investigator questioned teachers and pupils concerning the affective and musical characteristics of each of the five moods used. The answers revealed some degree of consensus. For example, of "frightened" tunes, it was claimed that they were fast rather than slow and were high up. Such tunes, it was said, used several different rhythm groups. The tune tended to be rising and there were repeated notes. It was found that when tune composers

were instructed to include such features in their "frightened" tunes, and to include other agreed features in the other four types of tune, a substantial increase in correct mood categorizations, over those obtained for tunes composed without prior instruction, was made. It was this, albeit minor, part of the original research, which prompted the present investigation, although the basis for it became altered and extended. The investigator had made an examination, after the first research and before the present investigation, of the incidence of the characteristics stated to feature in the mood tunes, but without any demonstrable success. However, it occurred to him that there could be ploys adopted by child composers, by which they succeeded in communicating, that were far more elemental than some of those suggested; such devices would be the very essence of music in such matters as pitch, rhythm and others.

It was decided therefore to design an investigation to attempt to isolate those ploys.

II. Survey of hypotheses

It has to be said at this point that the investigation began with a set of hypotheses, which, during the course of the research, had to be modified for various reasons. It is proposed to give the initial set and, after an "exposé" of what transpired in examining those hypotheses, to give the amended set which then influenced the design of the experiments.

1. Initial hypotheses

i. Junior children can communicate moods through original melodies by virtue of one or more essential, identifiable components.

ii. The essential components, used singly or in combination are:

a. pitch b. rhythm c. speed

d. pulse e. metre f. timbre

iii. Response varies as the personality of the composer.

iv. Response varies as the personality of the listener.

v. Response varies as the perception of the composer.

vi. Response varies as the perception of the listener.

vii. Appreciation of the component/mood relationship varies as the sex of the composer.

viii. Appreciation of the component/mood relationship varies as the sex of the listener.

ix. Children like ambiguous tunes more than unambiguous tunes.

2. Difficulties encountered

i. Pitch

The problem concerned ABSOLUTE pitch. In order to try to show that this was an ingredient of successful communication, it was hoped to produce a copy tape recording of pupils' melodies, either with the whole tune moved up by say, a fifth, or moved down similarly. The difficulty was that because of the range employed by the composers, such an alteration would have placed the tunes outside the span of the available instruments at both ends. The advice of experts was obtained to see if it were possible to obtain the desired result electronically, but it seems this is not possible, without introducing other alterations, such as a variation in timbre. Reproducing the tunes on a "Phillicorda" organ, which has the facility for pitch shift, was considered, but rejected because of the altered timbre, because of lack of note decrement and because the organ notes were not percussive in aural quality like those of a glockenspiel which, in the event, was the instrument chosen.

ii. Pulse and metre

It was planned to make copy recordings of pupils' melodies where, if the original was in duple pulse, the copy would be in triple pulse and the reverse. Indeed, a pilot tape was made and tried with adult music experts, but numerous difficulties were encountered; such as, a tune perceived to be in six-eight time by some but

being perceived as duple by others.

A revised set of hypotheses was drawn up, although amendment of parts of the original hypotheses should not be taken to imply that they may not be capable of acceptance as they stand. Modification of the original hypotheses to the modified version given below was thought legitimate in order to unify some concepts and in so doing to make consideration of findings and implications less unweildy. The modifications also remove from further consideration some questions upon which it appeared doubtful if a firm basis existed for study as, for example, the matter of pulse.

3. <u>Revised hypotheses</u>.

1 (i) Junior children can communicate moods through original melodies by virtue of one or more essential, identifiable components.

1(ii) This communication is made by virtue of one or more components.

2 Communication is dependent on personality.

3 Communication is dependent on the ability to disembed.

4 Children like ambiguous tunes more than they like unambiguous tunes.

CHAPTER TWO

Survey of Relevant Knowledge

Summary of Chapter

Music is all-pervasive through human history and across most cultures. It is a psychological and sociological phenomenon which seeks expression both for its own sake and as a means of communication. It has various effects on its listeners who may experience it as a pure form, or "hear-into" it connotations stimulated and enriched by their previous life-experiences. For some, music is an entity, an end in itself; for others, it is a means towards something further, perhaps a meaning, or perhaps an emotion. For yet others, music is a conglomerate compounded of both.

Preamble

Of relatively recent origin, the studies of musical ethnologists have drawn attention to the foundations of primitive music. From these studies, made within some communities at present still living primitive existences, it has become possible, not only to appreciate the origins and scope of the musical art form, but also to understand the pervasive nature of music in life. It is now possible to show that music rests on bases psychological, religious, sociological, symbolic and linguistic. SCHNEIDER (1957) enlarges upon this and says that the:

> " ..... growth of melody is undoubtedly one of the main reasons why music is so significant in the life of primitive peoples."

and he proceeds to show the connection between melody, rhythm and dancing, and the interactions between groups and individuals. These interactions may serve the purpose of unifying such groups. SCHNEIDER (op. cit.) remarks:

> "The agreement of sounds is always a symbol of identity or at least of mutual understanding."

Such symbolizing is perhaps an equally strong force today, when countries use national anthems to precede international football matches, when manufacturers attempt to characterize their products advertised on the television screen by using either traditional and well-known music or by using

specially composed "jingles", or when dramatic serialized stories or even children's cartoon films, rely upon a few bars of music from the standard repertory of, say, Kachaturyan or Beethoven, albeit in "arranged" forms, to make a continuity with a preceding part, or to "set the scene".

Nor is this pervasiveness of music into all aspects of life concurrent with the development of television. Doubtless, many of man's major experiences have been heightened by musical experience and development. DARNTON (1940) restates what others have said:

> "The first sound we can be aware of is the pulse of the mother's heart-beats. What do we feel like when we are pushed head-foremost into the world, and that insistent accompaniment to our consciousness stops for ever? Is there in some of us, perhaps in all, a desire to realize again that lost association of warm, comfortable omnipotence? I think of the drum beats in simple dance music and connect them in my mind with the remarkable and almost universal passion for the dance which appeared concurrently with the breaking-up of family life after the Great War."

The use of music appears to be general across cultures and seems unbounded by time. The Egyptian ceremonial used music, Joshua knew the power of the trumpet, the psalmist tells of the use of music in the praise of God, the antipodean aboriginal thought his music could

invest and be invested in spirits. Traditionally, the poet has created verse crediting the gods with musical invention. Writing of a disused tortoise shell, the poet LOWELL (1869) said:

"So there it lay, through wet and dry,
As empty as the last new sonnet,
Till by and by came Mercury,
And, having mused upon it,
"Why, here," cried he, "the thing of things
In shape, material and dimensions!
Give it but strings, and lo, it sings,
A wonderful invention."

From the point of view of this research, the pervasiveness of music as affecting the senses and sensitivities and character, is of outstanding importance. That music has such power is documented not least by SHAKESPEARE (1596):

"The man that hath no music in himself,
Nor is not moved with concord of sweet sounds,
Is fit for treasons, stratagems, and spoils;
The motions of his spirits are dull as night,
And his affections dark as Erebus:
Let no such man be trusted."

With the all-pervasive nature of music in mind, it is proposed to examine the nature, and some of the possible mechanisms, of musical experience under the following headings:

1. Introduction.
2. Perception.
    a. Personality.
    b. Temperament.
    c. Gestalt.
    d. Attention and Response.
    e. Code and Conservation.
3. Aesthetics.
    a. Emotion.
    b. Ambiguity in Music.
    c. Reaction and Experience.
    d. Communication and Understanding.
    e. Cognition and Feeling.
4. Conclusion.

However, owing to the involved nature of the subject, it will be found that occasionally some headings include references to concepts included in other sections.

1. Introduction

It would seem reasonable to suppose that in all human life, each individual has numbers of points of contact with the world outside himself to which he attends. He does this in order, it is held, to satisfy "needs" and "drives" within himself. Such "needs" may depend on the values held by people within a culture; YOUNG (1943) suggests that there is a need to win pre-eminence, this being but one of many needs. MASLOW (1955) sees "needs" as either "deficit" or "growth" needs and these latter appear to be related to creativity and as such are again a factor of the culture within which an individual finds himself.

On the other hand, "drives" may be more primitive in origin, stemming even from the experience of hunger or pain which cause the individual to adopt reactions aimed at satisfying that hunger or alleviating the pain. Yet other "drives" may result from an interaction with external stimuli which may result in aggression, or anger or frustration.

However, one "need" referred to by TYLER (1971) is:

> " ..... the need to relate oneself to something larger and beyond one's self, that is the need for a philosophy of life."

Clearly, he is not concerned here with such a primitive need as for instance, the desire for food, but for the need to see how the self fits in to the pattern of life and importantly to know how to attempt to integrate with the rest of humanity. Now this striving to know what passes in the consciousness of humanity demands that the individual shall become himself aware, either by act of volition or otherwise, of how other minds respond to the impressions made upon their sensors, the eyes, the ears, the taste-buds and so on. The knowledge gained will influence his own appraisals.

However, not only will an individual's appraisals be affected by the input of information from without and by his perception of it but some appraisals will be the result of original reactions which stem from some

intellectual procedure within the individual himself. The resulting behaviour, as impressions are processed by the intellect, will be modified by interactions, stimulated by data both from without the individual and within. The compelling wish of people to allow themselves to be infected by other people's thought and responses is discussed by NUNN (1947). He refers to this tendency "mimesis" and defines it as:

> " ..... the general tendency shown by an individual to take over from others their modes of actions, feelings and thoughts."

The theory of mimesis is particularly relevant to music about which SILBERMAN (1963) comments. He says music is:

> " ..... chiefly a social phenomenon. Social because it is a human product, and because it is a form of communication between composer, interpreter and listener."

It is demonstrably apparent that people often gather together to take part in such communications, and this gregarious action, according to the theory of mimesis, assists in the success of the communication. NUNN (1947) says:

> " ..... in so far as mimesis affects feeling it leads to 'fellow-feeling' or sympathy in the strict meaning of the word ..... It is community of feeling that converts a mob of unrelated individuals into a body moved by a single will ....."

For the musical experience to be felt by an audience, there

is then, a group interaction and in some way the individual listeners are able to infect the members of the group. This phenomenon was described by McDOUGALL (1920) as the "direct induction of emotion". FREUD (1921) supported this explanation of the phenomenon but modified his version by requiring that for the induction to take place, the members of the group needed to have a unity of purpose in being together.

Yet to maintain that the operation of the intellect depends solely on such stimuli, akin to the irritability of the amoeba on encountering a miniscule speck of grit would be to undervalue the human response. The falsity of such a position was noted by GAGNÉ (1965) who wrote:

> "The principal weaknesses of the stimulus-response theories are the total lack of consideration or an inadequate treatment of the place of cognition, insight, understanding, motivation, and the perceptions of self in learning, the mechanistic and behavioristic concept of human behavior ....."

Indeed, that cognition does have its part to play in musical experience was demonstrated by DREVER (1947) who found in galvanic skin response tests that the musically trained showed a greater response than the untrained.

The concepts mentioned are not the only ones which bear on the nature of the musical experience; these now must be scrutinized.

2. Perception.

Before a detailed review of ideas concerning perception is undertaken, some matters of a general nature will be considered.

Early interest centred around perception as a purely physical phenomenon, usually with regard to acuity of vision; scientists such as Kepler and Newton experimented in the field. Further research investigated the phenomenon of colour perception but it was not until comparatively recently that visual perception and emotion were seen to be related (KRAVKOV 1941). Of perception NUNN (1947) says it is:

> "..... the earliest of intellectual activities ..... the key by which all the rest may be understood."

while DIXON (1972), looking at the actor rather than the act, says:

> "Perception can be regarded as the process whereby in order to satisfy its needs an organism gains information about its environment."

However, neither approach implies the interaction which is thought to exist between what is perceived and the whole being of the perceiver; this interactional view is clearly propounded by ADCOCK (1964) when he writes that:

> "..... perception is dependent both on the nature of the outside world and the nature of the individual."

In this enquiry into aspects of communication in the original melodies of young children, it may prove useful to consider certain viewpoints concerning perception, since HOWES (1956), elucidating the term 'aesthetic' in relation to music says that:

> "By derivation the word means 'appertaining to perception' ....."

Further, BARTLEY (1969) says that the way in which an individual enriches himself is by appreciating the quality of his environment and this influences the way he feels. In this process, he says perception has a part. The aesthetic state is closely involved in listening to music and the feelings it engenders, so it would seem at least reasonable, if not important, that the processes consequent upon perception during the appreciation of music should be examined.

A distinction needs to be drawn between physically 'hearing' the sounds which are accepted as music and intellectually 'perceiving' them. Clearly, in order to perceive intellectually, the listener must hear the sounds, even if by virtue of 'chant interieux' but in that perceiving some further process extra to the initial hearing must be involved in order that the raw sound may be refined

into what is construed as music. As SWANWICK (1973) writes:

> "..... we do not only mean perceiving the sounds clearly but also that it 'makes sense' to us, that it communicates some meaning."

a. Temperament.

Historically, as VERNON (1973) reminds, the term 'temperament' was restricted to describing four types of human response viz. sanguine, choleric, melancholic and phlegmatic. However, the scope of these characteristic behaviours suffered change, BURT (1940) suggesting that there were two main divisions of temperament viz. general emotionality, and the degree to which an individual conformed with an ideal extraverted or introverted type. The general emotionality factor is discussed by WYBURN et al (1964). When writing about the differences between the reactions of people to what is perceived when stimuli are considered identical, they say:

> "..... differences are due to innate variations of temperament, or inborn disposition for a high or low degree of emotionality."

STORR (1972) links emotionality with sociability and, after affirming belief that 'ego strength' is a notable characteristic of creative persons continues to say:

> "Tests which demand a perceptive appreciation and appraisal of the needs of others reveal that creative people are emotionally and socially sensitive."

STORR (1978, private communication) further says:

> "Creative people combine within themselves paradoxical characteristics. Most people who have what is called a developed or strong ego seem not to be very open to new experiences or sensitive to other people's points of view. Creative people on the other hand, seem able to retain this openness while at the same time retaining a strong sense of their own identity as unique individuals."

ROKEACH (1960) refers to open- and closed-mindedness as regards the assimilation of new information, especially when new schemata are to be set up. LEVY (1970) believes that the employment of mindedness strategies affects some cognitive styles and in particular says:

> "It is believed that individual differences in problem-solving, creativity, prejudice, and changes in social attitudes depend upon this property."

A factor in variation of temperament may be due in part, says SPEARMAN (1927) to the degree of perseveration displayed, this characteristic being part of the temperament, as JUNG (1923) saw it, of the introverted person. In the present investigation, he may be the child

whose approach, being deep and narrow, is enabled to focus on the essential constituents of the communication to be attempted. EYSENCK (1968) says of the introverted type:

> "..... the introvert's activity is mainly in the mental, intellectual sphere ..... His emotions are easily aroused ....."

and such a conception would be expected to assist pupils in successful communication of mood through their melodies since it is reasonable to suppose that those who have a stored wealth of experienced emotion as part of their schemata, should be able to effect recall, albeit with varying degrees of success, of relevant parts of it when the situation demands it. He further supports this contention:

> "..... we would expect extraverts to be difficult to condition and introverts to be easy to condition. This deduction has received experimental support."

It is probable that the way people respond to the mood of music is a learnt behaviour within a culture (the incomprehensibility of much primitive oriental music to the occidental mind is notable) and such learning has connections with conditioning. EYSENCK (1960) concluded that introverts tended to maintain the habits they had formed and were less likely to allow them to be modified: in which case it seems reasonable to suppose that the subjects in this investigation, if introverted, could be

expected to be considered to remain in their place on the continuum felt to exist between being "efficient or inefficient" in the reception of communication. However, this variable is not under scrutiny.

b. Personality.

JOYCE (1972) said:

> "Personality is the psychological 'style' of an individual, the rather consistent foundations on which reactions to life situations are based. Personality is what gives our friends and close acquaintances a chance of predicting our responses in given circumstances."

This concept of personality as the presentation of a character has roots in Greek drama and the PERSONA, the theatrical mask worn by players to enhance the audience's perception of the character portrayed. But real life is more than donning a mask although the effect may be similar. The mask cannot alter its form but a real character can be seen to change according to its interaction with the environment. BEECH (1972) points out that in life situations overt action is compounded of the biological structure of a person and the social environment he is in. Additionally, the theories of FREUD (1901) had, at the turn of the century, suggested that what a person was thought to be, what behaviour a person adopted was a fusion of what he wished to do and what he decided it was permissible to do, the resultant when part of the subject's schemata, contributing to his personality.

MOWRER (1950) had, however, already modified the idea of man as purely a reactive creature. He suggested in his model that people may well have developed habits, inherited and acquired drives, but they shape their behaviour by taking thought. What they feel as a result of what they do or propose to do may be reflected in any artistic expression that may follow; and this is the basis of some strategies of psycho-analysis. As regards music and personality..... and this is mentioned bearing in mind the reservations of MEYER (1965) which receive comment shortly ..... MITCHELL (1950) said:

> "..... each piece should be considered as an expression of the personality of its creator."

However, there is the problem of reliable interpretation in such conjunction. It cannot be certain that in every case the composer's personality is indeed reflected in his music; as MEYER (1965) warns, emotional response may well be modified from what would instinctively be felt to what may be deemed suitable as an imitation of the behaviour shown by others. With this in mind, it must be accepted that the pupils in the sample who were asked to compose certain types of tunes could well have been inhibited by desires to produce what they considered the investigator would like to have from them.

Present thought tends to draw a distinction between the person as a receiver of sensory inputs to which he reacts as does the eye's pupil to the light, to the

person as an active participant in the making of decisions even perhaps unconsciously as to how he will respond. In this respect, that personality is some kind of force (*see footnote) driving people from within is modified to a belief that persons have ways of construing reality, and because of the way in which the reality is construed, the 'cognitive style' used, will vary between subjects, and responses can be different. Rather than see personality then as a force which is uni-directional and proceeding from within an individual, it should perhaps be thought of as a response to a situation in which the person finds himself; and this is an interactional view.

BROVERMAN (1960a, 1960b, 1964) with regard to cognitive style, defined it as:

> "..... relationships between abilities within individuals."

whilst the uniqueness of interpretation by individuals of the inputs of experience which are part of the interaction has been commented on by CONKLIN (1969):

> "It appears most researchers conceive cognitive styles as a superordinate construct which is involved in many cognitive operations and which accounts for individual differences in a variety of cognitive and personality variables."

In order that the personality shall be

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* "He has a strong personality."

able to respond then, the individual must not only perceive an event, but also understand it; and understanding can come about only if the perceiver is able to make a meaningful link between the event and similar events within his experience and environment. For instance, were a Chinaman to hurl abuse at someone who had no knowledge of the Chinese language, possibly the only response would be one of puzzlement, or of amusement even. There would be no meaningful link for an accurate cognition. If the language used however were known the response could be totally different. But even then, depending on the individual, the response might be mild annoyance, harsh retaliation or physical retreat. Further exchanges might result in changed patterns of behaviour within both parties as further interactions came about. With respect to the hypothetical situation above, it is noticed that MISCHEL (1973) proposed that there are three areas to consider in thinking of personality. He maintained that personality is determined by situation, variables within the person and by what the person has already experienced. These three factors interact and as LEVY (1970) says, the person evaluates the data like 'an information-processing system'. And he goes on:

> "Behaviour is not considered a direct function of external events but of the person's interpretation of those events."

and:

> "..... the stimulus value of both internal and external events depends upon the meaning given them by the individual, who is conceived of as actively engaged in their organization and interpretation."

The processes used in interpreting the data have been separated out by KAGAN, MOSS and SIGEL (1963) who say:

> "One particular style involves the tendency to analyze and to differentiate the stimulus environment in contrast to categorizations that are based on the stimulus-as-a-whole."

This comes nearer the present research in that it indicates two possible ways in which the listening sample may have operated when categorizing the tunes they heard, and their further writing (p.76) could indicate for this research that some children may have responded by virtue of their feelings whilst others may not have allowed feelings to enter into their operations; perhaps they adopted analytic, inferential or relational models to guide them to conclusions. In such ways might personality influence mood categorization. Referring to the analytic method, KAGAN, ROSMAN et al (1964) add that the use of such a concept must not be influenced by 'popular' associations but the child must consider what alternative responses are open to him. He defines such reflection as:

> "..... the consideration of alternative solution hypotheses (either classifications or problem-solving sequences) when many alternatives are available simultaneously."

and of course, such a situation fits the 'modus operandi' of the children's part as listeners completely.

WRIGHT and KAGAN (1973 edn.) point out that the alternatives referred to in the above quotation may not all enter the intellect for processing simply because the subjects may lack previous experience upon which to base their apprehension of them and they continue:

> "Selection is a positive process, not a negative one. Perceivers pick up only what they have schemata for, and willy-nilly ignore the rest."

They hold, unlike ANASTASI (1958), that there is no mechanism for filtering out some perceptions to allow others through to the intellect and maintain that however complex the perceptions available they can be perceived provided the subject has the necessary schemata developed after training and experience to perceive all there is. A practical example of the foregoing ideas might be to consider some people in an audience listening to , say, a set of variations for orchestra. The intellectual student of music present may be rapt, not so much on the impact of all that sound as in his analytical mind tracing the various metamorphoses of the motto theme. Another person, less musically sophisticated, may be more concerned in keeping some sort of thread running through the work by struggling to find corresponding identities in

in sections of the piece by referring them to 'what they are like' e.g. that horse-galloping bit. Yet another might try to know what is happening in the music by watching which group of instrumentalists are receiving the conductor's attention; there may even be a young unwilling nephew escorting his elderly music-loving aunt. He can fight off boredom only by admiring the flaming red hair of the lady principal viola! All the psychological inputs are there, but what each person does intellectually is a function of what his previous experience tells him he can do, because he has developed the responses to what his senses convey to his mind. If this is so, it can only serve to underline the importance to the teacher of developing his own schemata, whether musical or perceptual of people and their reactions to the musical experience, for only then can he hope to be able to guide those who seek help to fuller understanding of the appeal of music. As WRIGHT and KAGAN (1973 edn.) say:

> "The more skilled the perceiver, the more he can perceive."

and that surely applies equally to teacher and taught.

The use of the term 'analytic' above has taken on another facet of meaning from the generally accepted one of looking at the parts that make the whole. A use of this word has developed to describe the way in which one

component or perhaps more than one, of a group of stimuli to the intellect appears to stand out, or 'disembed' itself from the others which are accepted as a background. WRIGHT and KAGAN (1963) were at some pains to make clear the use of the word 'analytic' in their work on perception, as indicating a disembedding function. In reference to the previous conception of analysis and synthesis as against the alternative usage taken by WITKIN (1954), they said;

> "Some children are splitters, others are lumpers. We have called the former response an analytic attitude and believe that it is related in some degree to Witkin's notion of field independence versus field dependence."

and WITKIN (1959) was himself definite about his use of the word 'analytic':

> "When we use the term analytic, we refer quite specifically to the ability to overcome an embedding context, that is, to experience an item independently of an organized field of which it is part."

Disembedding, 'analysing', in a musical context presents special problems. In melodic writing, the figure and the ground cannot co-exist, and when a person listens to the figure, memory is called into operation. This is a little different from visual tasks, like looking at a painting, because in that representation, all the components of form and colour co-exist and different search strategies are called for.

There are also different problems between visual and aural disembedding to do with time. Visual disembedding can be done within a time span chosen by the viewer; the pace of aural disembedding is set by the progress of the music; and no back-tracking can take place either, except through memory which may mislead. With music, as DAVIES (1978) says:

> "If a person gives a wrong answer, it's difficult to say whether he failed to disembed it, or whether he forgot before he got that far."

That observation suggests that the perceptual strategy employed is limited by memory, a view expressed earlier by GIBSON (1969):

> "..... some sort of memorial representation of the distinguishing and invariant feature of a stimulus object or event is involved in differentiation of it from other objects or events ....."

Differences of opinion exist as to what the intellect does when the perceived input is being processed. On the one hand, BRUNER (1957) suggests that the mind seems to hold what might be termed 'categories' built up from previous percepts and all new percepts are compared with these from various cues in the stimulus. This model could in fact fit into this research, for it could well be that some children categorizing the mood tunes they hear, do so by analogy with music previously heard. However, ANASTASI (1958) adds further insight when he writes:

> "Perception is not a process of matching to a representation in the head, but one of extracting the invariants in stimulus information."

But that again, is part of what this research is about; the existence of components in tunes, the 'invariants' which if perceived, assist the subject to make a categorization of the mood of the music. Possibly it needed WITKIN (1960) to point out that the analysis and extraction of particular parts of an input have some dependence upon not only personality but upon maturation, whilst VERNON (1960), developing the folk view that old heads cannot be put on young shoulders, proposes further:

> "Perceptual and reasoning abilities improve through natural maturation; but they also require ..... encouragement and help from adults."

and the need for this support is documented by, amongst others, TORRANCE (1962) and MEARNS (1941).

The Personal Construct Theory as viewed by KELLY (1955) may go some way to uniting at least two views so far implied viz. that personality is affected both by conditional response and by a more deliberate purposeful hypothesizing within the intellect. He claims that the input itself cannot be defined as specific or even objective; and that the only course open to a person is to interpret events

constructs, which become valuable to advance further understanding and provide some bases to predict future events. The totality of his theory in fact, is based on the view that:

> "A person's processes are psychologically channelled by the ways in which he anticipates events."

PECK and WHITLOW (1975) crystallize thus:

> "The person understands the world in terms of 'constructs' (concepts) that have predictive utility for him. Thus a construct is more than a mere label; it is a way of predicting future events."

and the sort of construct system a subject develops defines his personality.

Some affinity is apparent between constructs and typologies, each resulting from a fusion of common ground from what is perceived. Eventually of course, the latter become stereotypes and although these can be the root of prejudice they do, as VERNON (1973) says, help us:

> "..... to classify and respond to the infinitive (sic) diversities of people we meet ....."

Since the characteristics, traits, attitudes can be pigeon-holed for use in anticipation. As regards hearing NEISSER (1976) says:

"The listener continuously develops more or less specific readinesses (anticipations) for what will come next, based on information he has already picked up ..... These anticipations ..... govern what he will pick up next, and in turn are modified by it. Without them, he would hear only a blooming, buzzing confusion."

This view of the development of anticipation with regard to music is a fascinating one. It has connections with the ability of experienced listeners to be able to assimilate more quickly at first hearing a melody by, say, Mozart if they are already well-stocked with Mozartian idiom; the first hearing of, say, a Shostakovich melodic line however, might not be as readily assimilated, certainly not if the listener works within the constraints imposed by Mozartian idiom. There is little possibility of anticipations being used, dependent as they are on previous knowledge. The same could be said for other aspects of music such as harmonic basis and orchestration. If this argument is applied to this research, it is a matter for some speculation if young children are able to anticipate the character of the melodic line of the tunes composed by their peers. Whilst the extra-curricular musical experiences of radio and television, together with the playing of records at home will have their effect, it is not considered that these will have had a major influence upon the anticipations, at least of melodic line, since the character of the music composed by the sample bears little resemblance to them; this can be made evident if the taped tunes included within the covers of this volume are played. Can it be inferred then, that their anticipations are

more likely to be based on those components of the tunes which are shared with the standard repertory in the musical heritage, such as rhythm and speed?

c. Gestalt.

It is a matter of common ground that a melody evolves when sounds of various pitches follow each other rhythmically in a way found acceptable to those who hear them. However, the work of the gestalt psychologists has shown, by implication, that whilst our perception of each note of musical stimulus is essential to accepting successive notes as becoming a tune, more is needed from a listener before he in fact perceives the melody as an entity; MEYER (1965) says this:

> it "..... is rather a matter of grouping stimuli into patterns and relating these patterns to one another."

This procedure of putting together the parts to make the whole so that a listener is able to respond, points up the fact that the tune has become something more than the sum of parts; a relationship between the parts, not at first apparent now emerges, rather like the appearance of the photographic print when it is being rinsed in the developer. ADCOCK (1964) says that:

> "..... we have not only entities, but relations between the entities whereby they can enter into larger wholes."

The gestalt concept of parts and wholes has some place in the "Signification Theory" about which BEARDSLEY (1958) speaks. He maintains that to 'understand' music, whatever that may mean, is:

> "..... to organize its sounds into wholes, to grasp its sequence of notes as melodic and rhythmic patterns, to perceive its kinetic qualities and, finally, the subtle and pervasive human qualities that depend on all the rest."

It may well be that those pupils in the experimental sample under review here have, as far as those who were able to communicate are concerned, the gestalt quality of ability to organize into meaningful wholes, if they are tune generators, or the ability to perceive the qualities in those wholes, if they are listeners. Possibly, their ability to do this is a factor of their ability to separate figure from ground, to separate the experiential meaning of a particular melody from their store of all other experiences.

WYBURN et al (1964) refer to two further principles of gestalt psychology and these may bear on this research. They write:

> "The second principle is that of 'segregation' and 'differentiation' by which the patterns of stimuli form certain structures in perception owing to their special properties. The third principle is that of 'closure' by which incomplete structure patterns tend to be completed in perception."

It is central to the main hypothesis of this research that children must in some way perceive, both as tune generators and as receivers, special qualities in the components of the music composed, qualities which further the successful communication of the intended mood. As well, it may be that the success of listeners in recogizing the particular qualities which communicate a mood, may be a function of their ability to 'take a hint' from the limited amount of information supplied; in other words to use 'closure' in order to add to and complete a perception. However, the problem is that there is no guarantee that the closure used is supplying the additional material that might have been supplied by the tune generator had he decided to give it in full. This clearly would lead to doubt as to whether the intended mood will in fact be perceived. It further appears, following the work of PEMBERTON (1952) that there could be a link between closure, and cognitive and reasoning ability.

The concepts of schizothyme and cyclothyme were introduced by KRETSCHMER (1925) and their connection with the tendency to behave in analytic or integrative ways was noted. ANASTASI (1958) suggests that some are 'synthetic' perceivers, others are 'analytic'. As far as music is concerned, it is an open question whether indeed there are these two classes of perceivers; it would be interesting to see if listeners in fact operate one way or the other, although IGAGA (1974) suggests that whatever may

be done, in the listening process:

> "..... parts are so interwoven and interdependent that it is difficult to isolate them."

d. Attention and Response.

BIRKHOFF (1933) linked perception with attention when he stated:

> "In order that the act of perception be successfully performed, there is also required the appropriate field of attention in consciousness."

This raises a question in the present enquiry, namely that it may be that a tune varies in its efficiency to be communicated not so much because of its intrinsic content but because of varying degrees of attention by the auditors or even, during a particular tune, by a particular auditor. Further, since JEVONS (1871) showed that there is a limit to the number of objects which a subject can discriminate, it may also happen that music contains too many elements for some auditors fully to perceive all the information necessary to a successful communication. Indeed, MOLES (1968) has said:

> "The individual receptor has a limited capacity ..... for the apprehension of information ....."

and continues, saying the 'the musical message' is

'in general overwhelming'. Further, he declares:

> "The receptor assimilates not the whole thing, but fragments, chosen either randomly or according to rules ....."

and it thus seems reasonable to suggest that if attention is insufficient, 'fragments' essential to the communication are going to be overlooked. AVERBACH and SPERLING (1960) add a further complication to the process of perception when they point out that attending to incoming information is but one aspect of the process; perhaps equally important is the ability of the auditor to store the various inputs long enough for a conclusion to be drawn. They refer to:

> "..... the interesting fact that ..... information decays very rapidly ..... It was not the immediate intake of information by the senses which was limited, but rather the time it took to identify the stimuli and report them, and the time for which they could be stored."

EMPSON (1947) had apparently had similar thoughts on the matter, for he refers to the need to hold a 'variety of things' in the mind long enough for criteria to be applied to them simultaneously. BROADBENT (1958) however, suggests that in the process of assimilating information, listeners discard part of the information which reaches the ear. He attributes the degree of discarding and what is discarded to the experience of the listener. As regards the children who listen

to the music samples, it must be to some extent fortuitous whether or not the information vital to the communication of the intended mood, unless both partners to the communication have had sufficient musical experience earlier, is discarded. It may be that such earlier experience indicates what may be without loss discarded. In the absence of any authenticated method of appraising such experiences, it is probably not feasible to ascertain this. What does seem certain is that as QUASTLER (1955) mentions, more information is often supplied than is perceived. MOLES (1968) sums up succinctly:

> "TO PERCEIVE IS TO SELECT; to apprehend the world is to learn the rules of perceptual selection."

ABERCROMBIE (1965) is of similar opinion and approaches the idea of perception thus:

> "..... our reacting to the present bombardment of information involves ignoring some of it, seizing the rest and interpreting it in the light of past experience in order to make as good a guess as possible about what is going to happen. This may be called a process of JUDGMENT; that is, making a 'decision' or conclusion on the basis of indications and probabilities ....."

It would be erroneous however, to believe that a subject perceives all stimuli that are available; as BARTLEY (1969) suggests, not all stimuli in fact stimulate. WYBURN et al (1964) say that perception is influenced by many factors, and

it may be inferred that the reception and response to stimuli are modified by:

> "..... the effects of details in the objects perceived, the mental setting which makes perception possible, attitudinal factors, and quasi-inferential processes ..... there is no perceptual situation which is not dominated by some part of the material such as an odd or apparently incongruous aspect or feature, the disposition of figures and their relative emphasis, or the suggestion of familiar objects."

The idea of multiple effects of stimuli can well be seen in figure-ground effects, such as the 'PETER-PAUL' goblet and the MULLER-LYER illusion. As GREGORY (1972) points out, perception is a matter of subjectivity; objects are seen as reconstructions from a particular point of view; change the viewpoint and reality may become unreal! This may well account for the changing perceptions that some auditors may have for the music they hear; for instance, and pertinent to this research, six-eight rhythm may be perceived as triple pulse but re-heard (even mentally) only seconds later, as duple pulse. DREVER (1960) refers to this concept of perception as that of 'stimulation';

> "..... an attempt to give an orderly account of how things look under various conditions of sensory excitation....."

but suggests also that amongst four approaches to understanding perception, there is the 'association' approach. It would seem that for some people this approach is apt to music, for to some listeners some musical content is

describable by simile. However, this very fact is responsible for much of the problem in trying to decide what music 'means' since words are not sufficiently precise in their import and this could account in part for discrepancies in the way that children perceived what they heard in the melodies to which they had to listen. For example, LEGGATT (1974) said:

> "..... a child might consider 'dreamy' to mean what can be descriptive of a part of sleep while another thinks it applies only to a 'pop' idol!"

MYERS (1927) refers to the association approach when classifying listeners into types. He concludes that most people's response to music is a mixture of association, sensations, colour visualizing and critical analysis. It would seem reasonable to suppose therefore that the final percept is brought about by the responder making many appraisals. These are, in turn, the outcome of an interaction between the incoming information and an existing schemata formed of what has gone before. DIXON (1972) says that this fresh percept is itself stored and:

> "..... becomes a determinant of future perception."

ADCOCK (1964) observes that percepts are the result of another interaction, that between what is dependent on

learning forming the schemata, and what is part of the perceiver's innate ability to organize the incoming perceptions. He further posits that perception comes about through the human exploratory drive which assist the:

> "..... coding of the universe in a representational system which will enable us to carry out appropriate actions to satisfy our needs."

and this concept links with some already hinted at in the introduction to this chapter.

e. Code; conservation.

Reference in the quotation above to the process of 'coding of the universe' is commented upon by KOESTLER (1964). He demonstrates that ordered behaviour is governed by a set of fixed rules, termed by him 'the code'. Such a code, he affirms, enables the person to formulate a matrix of possible behavioural responses to what he perceives to be his needs so that he may cope with his immediate environment. Just what course of action he adopts will be a function of the limiting features of the environment; out of an appraisal of these features, a strategy will be designed. This model of 'code - matrix - strategy' is one which demonstrates the processes adopted by the pupils in the sample. The pupils, in order to be able to communicate, perceive,

whether intuitively or cognitively, the 'rules' common to all tunes that embody a particular mood; they somehow possess the matrices of information and, when a composer of a mood-tune performs his music, the listener determines his strategy to help him decide on the type of mood being communicated. The process by which the communication takes place is both perceptual and reasoning; in this process it may be inferred, after WITKIN (1960), that age, intelligence and personality play an inter-related part. Further, VERNON (1960) writes:

> "Perceptual and reasoning abilities improve through natural maturation; but they also require the opportunity for exercise, and they require encouragement and help from adults."

It seems that what passes for musical communication may well be possible of cultivation if the above writer is correct, since communication is a matter of both perception and reasoning. It could be said that the perception has led to an awareness of meaning;

as ADCOCK (1964) asserts:

> "We might argue that the whole point of perception is meaning, and that to perceive without finding meaning would not really be to perceive at all."

3. Aesthetics.

To omit any reference to Aesthetics in this research would be unthinkable; yet because of the scope of the subject and the comprehensive literature pertaining to it, the investigator may well be charged with paying scant attention to the subject in the few following lines. It is considered however, that since this research is not into the aesthetics of communication through music as such, what follows could be acceptable if recognized as an acknowledgment of the intrinsic and underlying importance of a study of aesthetics in any musical considerations.

A definition of the concept of aesthetics has been given as:

> "..... the science of the beautiful in nature and the fine arts." (Nuttall's Dictionary).

However, it would appear that this is a meaning altered somewhat from the implications of the original Greek from

which it came. FOWLER (1950) says the adjectival form, 'aesthetic':

> "..... was introduced into English to supply a SENSE OF BEAUTY with an adjective ....."

but that etymologically speaking, the word means:

> "..... concerned with sensuous perception."

Indeed, the NUTTALL dictionary, referring to this adjective 'aesthetic' gives the derivation as:

> "Gr. AISTHANOMAI, to perceive with the senses".

The medical use of 'anaesthetic' which implies a dulling of the senses cannot pass unnoticed; but what <u>is</u> noticeable is that no mention of beauty is made nor would it seem proper to infer any suggestion of 'the beautiful' from it. The body of opinion rejecting the idea that beauty is inherent in music is joined by LUNDIN (1967) who says of beauty:

> "Rather, it is a property which the organism has IMPOSED on the object. Any object can be beautiful if it elicits a response of the organism which by its very characteristics may be labeled aesthetic."

Another elucidation of the term is made by HOWES (1956)

"By derivation the word means 'appertaining to perception' and perception is the primary organisation of our sense impressions, i.e. it is a kind of knowledge obtained through the senses. Aesthetics is thus the science or study of sensuous knowledge."

Doubtless HOWES (1956) had realized with MEYER (1965) that earlier philosophies like those of Helmholtz, Wundt and Stumpf based as they were on an assumption that music was a form of pleasurable sensation, were responsible for formulating an aesthetic which was based on liking and disliking and a search for sensationalist definition based on beauty. MEYER (1965) says:

> "But beyond a description of tested pleasure-displeasure reactions to simple sounds or elementary sound complexes ..... this approach has not taken us ....."

A similar position is adopted by READ (1950) who says:

> "..... identification of art and beauty is at the bottom of all our difficulties in the appreciation of art ..... ART IS NOT NECESSARILY BEAUTY ..... we find that art often has been or often is a thing of no beauty."

REVESZ (1953) though, holds that to maintain that:

> "..... music has only an emotional impact, delights or saddens us, affects us strongly, stirs our feelings ....."

must necessarily condemn listeners to the 'extra-aesthetic sphere of musical effects'. He says:

> "We must hold fast to the thought that the musical-aesthetic, the beautiful in music has reference to the AUTONOMOUS EMOTIONAL EFFECT OF MUSIC ..... which ..... can arouse responsive feelings and create an aesthetic experience."

Later in his argument REVESZ (1953) claims that the main aim of music should not be direct emotional effect, since this would remove it from the field of aesthetics and bring it into the orbit of everyday emotional experiences. SEASHORE (1938) gave the conveyance of meaning to the listener a high priority in aesthetic experience, but SCHOEN (1940) opposed this idea diametrically, considering meanings only of small influence in the aesthetic experience. It could well be that LUNDIN (1967) comes nearer to the truth of the matter when he writes:

> "The aesthetic experience is a combination of many psychological activities. At any one time its main characteristics may be affective, at other times highly intellectual, and at still others almost entirely sensuous."

If that position can be accepted, it may be possible to accept the various criteria, paraphrased by REIMER (1970). Writing three years after LUNDIN (1967) he draws together from musical literature an evaluation of the claims of the Absolutists and the Referentialists. However, REIMER (1970) does go somewhat further (pp. 24-25) and he says that he can

argue the case that:

> "Absolute Expressionism ..... does in fact include the elements of truth found in both Referentialism and Formalism."

However, REIMER (1970) recognizes a dichotomy between the two viewpoints and states:

> "But while Expressionism cannot accept non-artistic meaning as central to art, it also cannot accept the Formalist notion of the intellectual, removed-from-life nature of aesthetic experience."

He goes on to make the case for the acceptance of the position that 'the qualities of which all human experience is made' are the very qualities which people recognize as being embodied in aesthetic experience; and the common ground is "felt by the perceiver of the work as 'significant'".

The position taken in this research is that any conception of 'beauty' as being essential to aethetic appreciation is inadmissible. It seems feasible that since two people can see a pot and one can like the shape while another may dislike it, the pot cannot simultaneously have pleasing qualities and unpleasing qualities. The assessment of the qualities is completely in the ascription of the beholder. Similarly with music, two people may hear music as being on the one hand cacophanous and on the other hand mellifluous; but if heard by the two listeners at the

same performance, it is the same music. Manifestly, the character of the music is not in it, but ascribed to it. It is claimed that this position is allowable in any consideration of the tunes composed by the pupils in this research. Clearly, they meet the requirement that they can be received sensually, in that they can be heard. Further, the tunes are pitched, rhythmic and contain other elements such as metre and dynamics, all of which are perceivable by sense. Whether tunes composed by the children have aesthetic merit --- if that word be used in the sense already discarded, namely that they are in some way 'beautiful' --- is in any case beside the immediate point. The research is not primarily concerned with making value-judgments on the supposed merit of the pupils' tunes, however that might or could be judged, although as a side issue it was thought to be of possible interest to make a small enquiry in which this aspect could be included. Further, it is claimed that to refrain from making value-judgments is defensible in the light of the position adopted by REIMER (1970) who states:

> "..... no mention has been made of liking or judging as elements in aesthetic experience.... neither is a proper component of aesthetic experience."

In this research, a crucial problem concerns how the aesthetic response by the listeners to the composers' music can be described. If it were described by

asking listeners to dance it, mime it, paint a picture or sculpt an object relating to it --- all perfectly legitimate pursuits in another context --- the results being themselves open to infinite interpretations would further confound the problem. It seemed to the investigator that even though there are crticisms that could be made of a verbally-based vehicle of description, this was the method least likely to cause confusion, and he has supported this elsewhere (LEGGATT 1974). If antiquity indicates respectability, BUJIC (1975) says that Monteverdi began a process which:

> "..... resulted in the formation of an elaborate system of musical rhetoric in which certain musical figures were said to express particular states of mind: calm, anger, agitation, etc."

In this research, the method of categorizing tunes, being a verbal one, gets away from what WITTGENSTEIN (1958) alleged must be done, namely, that to 'explain' music, the comparison with something else was the sole method allowable. LEWIS (1977) suggests that verbal response to music is more reliable and believes this response is brought about through the action of experience.

However, REIMER (1970) probably should have the last word when he indicates the interactions central to the aesthetic experience:

"Only one thing can properly influence aesthetic reaction. That is the aesthetic qualities of things themselves. To the extent that a person can perceive aesthetic qualities keenly, subtly, precisely, sophisticatedly, sensitively, his reaction can be keen, subtle, precise, sophisticated, sensitive."

and he remarks:

"The perception and the reaction are simultaneous and inter-dependent."

a. Emotion.

The concept of emotion, particularly as it is related to musical experience, is difficult to deal with. This may be because it involves the listener equally with the creator of the music, at many levels of psychological and physiological effect. SHEER (1961) observes:

"Everyone knows something of what is meant by emotion, but not precisely what."

In a footnote LOVELL (1973) writes:

"Emotion is a 'moved' or 'stirred-up' state of feelings in the individual linked with some tendency ....."

WOODWORTH and MARQUIS (1963) share this view of emotion when they assert:

"Emotions are stirred-up states of the individual."

while YOUNG (1973) enlarges on these descriptions thus:

> "I think emotional behaviour can be described as a perturbation, a departure from a normal level of non-emotional activity."

With regard to the generating of emotion within an organism, there appears to be some division of opinion. It may be that TOLMAN (1923) was indicating that there is some degree of reflex activity present in an organism which establishes an emotion. He says:

> "Thus, in fear, it (i.e. reflex activity) is an escape from the stimulus-object ....."

However, he also points to emotions as being part of adaptive behaviour. He posits that an aroused emotion is not an end in itself; rather is it one pole of a bi-polar interaction with the stimulus situation being the other extremity. He indicates his belief that it is possible for the aroused emotion, through the behaviour which it initiates, to affect the stimulus situation. If this is so, it would support the hope held by the investigator concerning one aspect of this present research. In creative music making, nothing succeeds like success. One purpose behind the enquiry is to seek to provide structure to the teaching given to pupils in the embodying of mood in music in the sincere belief that when

children think practically about how they create their music they will simultaneously be setting up a situation in which emotion felt at the time will be further developed into a finer, more sensitive experience. Ultimately, a circular progression could be developing, whereby the stimulus evokes music which in its turn develops further emotions and this again, one hopes, will result in further creativity.

On the other hand, PRIBRAM (1967a, 1967b.) considers there is more than a simple action/re-action basis to emotion. He considers that in some way, an organism develops a repertory of responses upon which it can draw, and that this repertory develops through the use of some form of 'action bank'. The contents of such 'action bank' are the result of memory of previous experiences. McDOUGALL (1928) had already written:

> "The true emotional qualities ..... spring to life ..... and continue to color the experiences of striving ....."

The position taken by PRIBRAM (op. cit.) implies that there must be some form of selection, probably at a non-volitional level, and this is supported and added to by ARNOLD (1960) when she defines emotion thus:

> "..... the felt tendency toward anything intuitively appraised as good (beneficial), or away from anything intuitively appraised as bad (harmful). This attraction or aversion is accompanied by a pattern of physiological changes organized toward approach or withdrawal. The patterns differ for different emotions."

She is quite clear that an evaluation of the emotion-inducing situation must take place, and that for an emotion to be aroused, understanding and estimation are of crucial importance. This bears directly on the choice of the moods which was made in the original investigation (LEGGATT 1974) and maintained for this enquiry. It would have been quite meaningless, one supposes, to suggest to a junior child that he should compose a tune which was, for instance, choleric, as it is open to doubt that a young child would know the term, even if he had experience of the emotion!

Thus far, it is already apparent that LINDSLEY (1951) was percipient of the complications which begin to arise in any consideration of this subject. He states:

> "Emotion is one of the most complex phenomena known to psychology. It is complex because it involves so much of the organism at so many levels of neural and chemical integration. Both subjectively and objectively its ramifications are diffuse and intermingled with other processes. Perhaps therein lies the uniqueness and possibly the major significance of emotion."

Herein of course, LINDSLEY (op. cit.) is drawing, as many students of the theory of emotion do, upon views held by JAMES (1913), views generally linked with those of Lange. In his critique the basis of the theory is that bodily changes are effected as the result of psychological objects and situations. There is a mode of response already formed in an organism to determine the organism's response to a situation and this response has far reaching effects for the complete organism. It is argued that the bodily changes thus brought about are specifically felt instantaneously with the input of the stimulus. He stipulates as an important basis for his views that there are visceral changes and that these are central to the sensation of an emotion. Like TOLMAN (q.v.) James supports the opinion that the knowledge an organism has of its bodily changes is reflexive, but James moves on to maintain that it is the awareness of the bodily changes which is felt emotion. This implies that James did not see emotion as a cognitive process. However, AVELING (1928) develops:

> "..... the picturesque language of William James, 'we feel sorry because we cry, angry because we strike, afraid because we tremble' and so on."

and he recognizes that previous experience causes an organism to develop a 'set' which proscribes the action it will initiate. He summarises thus:

> "..... the order of events would seem to be: first, cognition of a significant stimulus; second, conative 'set' towards it; and, last, the 'stirred-up' characteristics of emotion proper."

In the foregoing, the interrelation between responses of the body to external situations and the emotions felt, is implicit. Within the terms of reference which the researcher has set is the wish to see a greater relationship develop between the work of the teacher of music and the work of the teacher of dance drama. It is common for the latter activity to be performed to already available music which the teacher considers apt to the theme of the drama being enacted. Since music and physical movement are linked, could it not be that young children could derive more creative satisfaction if it were permitted for music to be 'purpose-made' by the dancers? And may not the converse apply? May not originally conceived music be more evocative for movement, at the child's level, than much in the standard repertory? Possibly, little relationship at present exists between creative dance and creative music because of the dearth of the latter. The present research may encourage through suggesting structure, ways in which children's creative music making can improve the situation.

Some aversion to the ideas of James and Aveling is demonstrated by CLAPAREDE (1928). He calls the classic concept of emotion as quoted of James by Aveling, 'antibiological' and 'antipsychological'. In his criticism

he writes:

> "To say as the classic theory does, that a situation arouses fear because we judge it to be terrifying, is either not to explain why we find this situation frightening, or to revolve in a vicious circle ..... to say with the classic theory that a situation makes you afraid because it is terrifying is to say that it makes you afraid because it makes you afraid."

and he dismisses the argument for circularity.

WENGER (1950) has modifications to offer on the opinions of Lange. Whereas Lange saw emotion as the awareness of bodily changes, emotion <u>inducing</u> visceral changes, Wenger considers the visceral response itself to be the emotion. He says:

> "We would distinguish between emotions per se only insofar as we can differentiate patterns of visceral changes, and we no longer would speak of visceral changes induced by emotion."

In considering emotion and the musical experience, YOUNG (1973) says:

> "The phenomena of human experience are always relative to the point of view, outlook, motives, or attitude and cognitions of the experiencing individual. Human experience includes the perceptions, memories, feelings, desires, intentions, plans and the like, of which the individual is aware."

It would seem that such experiences are the on-going

phenomena of the mind; the part played by music is to effect some modification to the elements of mental behaviour so that the normal routine of the organism is, for the time being, interrupted. A common psychological view of the origin of emotion is shared by RAPAPORT (1950) who refers to:

> "..... memories of previous traumatic experiences, persisting motives and attitudes, personal identifications, unsolved conflicts, unrelieved frustrations, unexpected rewards, and the like."

On the other hand, ROGERS (1951) suggests that part of the nature of musical experience is the internal process of finding answers to personal aspirations, of becoming aware, possibly at an unconscious level, of how our behaviour can be modified. He sees a relationship between the power of the experienced emotion and its effect:

> ".....the intensity of the emotion being related to the perceived significance of the behaviour for the maintenance and enhancement of the organism."

YOUNG (1973) expresses the view that such an adaptive role interacts with the emotions so that as the organism is influenced by his aroused emotion to adapt to his environment, so the new behaviour enables him to experience emotions

in a somewhat modified way; there must therefore be a constantly proceeding interaction in which he sees emotion as:

> "..... a dynamic relation between an organism and its environment."

It may be that such a view could go some way to explain how for instance, composers' later works appear to mature in style; consider the early and late quartets of Beethoven or his first and ninth symphonies.

The view of the interaction continually proceeding between the behaviour of an individual pupil and his emotional maturing is one which meshes well with the present view of the school curriculum (MUSGROVE 1968) which aims at bringing about change in the pupil's behaviour, this last word being used in its psychological sense. Music as part of the curriculum, must take its place with all the other agencies which can effect this change, and it is probable that the creative element of music, as opposed to the purely reproductive, important though that can be, can be a potent instrument in bringing about change.

In some way a musical experience calls up sensory impressions stored in the brain so that people, in varying degrees of arousal, are able to image the sounds. This, or course, is apart from and extra to the normal

procedures of hearing. To hear the music is not sufficient; it must be listened to. SEASHORE (1938) makes the point that those who are capable of becoming emotionally involved with musical sounds have a musical mind and says that the:

> "Music is essentially a play upon feeling with feeling. It is appreciated only insofar as it arouses feeling and can be expressed only by active feeling."

KRUEGER (1928) refers to the sensation which he terms 'feeling-LIKE' and this points up the subtle distinction about what a listener feels; does he in fact, feel the feeling or does he know the feeling, recognize that feeling? It is then, obvious that the imaging of sounds and the 'feeling-like' will vary directly as the pre-school experiences of pupils, and as far as the junior child is concerned, his experiences at infant school too. From this it follows that there will be varying responses amongst children to the music they hear, and there will be varying degrees of success --- and failure --- in their communication through original music. It will be the teacher's responsibility to diagnose which children are going to require his greater attention in order that they shall not, as adolescents in the comprehensive school, derive only some of the benefits to accrue from their musical education.

HEPBURN (1965) referring to musical

experience, asks:

> "Do works of art 'express' emotion, or 'evoke' it, 'represent' it, 'master' it, 'organize' it or 'purge' it? Or can they do several of these things --- or all of them?"

Thirty years after SEASHORE (op. cit.) he is of similar opinion with him that whatever the answer may be, the potential for what music can do to the feelings of a listener is not within the control of the listener but actually in the music. In support of his argument he says that it is not the listener who wishes the dominant seventh or thirteenth to move characteristically; HEPBURN (1965) invests the tones themselves with a wanting so to move. Similarly:

> "If the music modulates into a 'bright' key, the brightness is not my brightness, but the music's."

But the musical experience, according to HEPBURN (1965) is not in whether one discerns the full range of musical qualities in a work, but rather:

> "..... one wants to say it is what the music ..... does to you."

RUCKMICK (1936) suggests that at such moments of experience the listener displays attention of a high order as:

> "..... the emotion seizes everything in consciousness at the moment and makes it its own."

If for some reason it were not so, HEPBURN (1965) warns that the emotions:

> "..... will be only loosely related to the particular work."

Bearing in mind the importance of attention to the music, the investigator was able to provide, for both tune generators and listeners, a situation in which conditions for optimum attention were suitable. It seems to the researcher that under such conditions, what BEARDSLEY (1958) terms the 'encounter', would be more likely to take effect and more successfully at that. Of this 'encounter' he says:

> "I don't have control over it; it is like standing in a rushing stream and feeling the stream's force."

But when the satisfactory conditions have been provided any further responsibility for the 'encounter' is completely that of the listener. SEASHORE (1938), referring in another way to what MURSELL (1937) had earlier called 'the organizing and synthesizing activities carried on in the mind' says:

> "What a listener shall hear in music depends upon what he is, or is capable of putting into it, that is, hearing into it. Hearing is not a mere registering of sounds. It is a positive process of reconstruction in the mind of the listener."

It seems to the investigator that the reconstruction of what has been heard before is in part, an important element of the experience to be had from music. Just as the very young child craves to have a favourite story re-read as many times as the patience of the reader will permit, so, it may well be, the music listener wishes to reconstruct, either mentally or at performance, events which he well knows are going to unfold musically. Music of worth has its magical moments of anticipation, such as when the solo instruments, almost imperceptably at bar 72 make their very first solo appearance in Mozart's Sinfonia Concertante (K. 364), or the distant trumpet speaks in 'Fidelio'; or .....; the experiences in music such as these are myriad. It is a way in which music enables the listener both to travel hopefully and arrive.

How to characterize what music actually does to the mind is a matter for introspection. The writer may say that for him, included in his own experiences are:

the perceptions of tonal colour in Wagner;

the crisp, mathematical precision of the scherzo in the Second Pianoforte Concerto of Saint-Saens;

the draughtsmanship of a Bach fugue which in spite of, or because of it, brings satisfaction;

the ability to be transported musically and also historically by the early Baroque;

but such descriptions can mean little to others because of

the imprecision of words. With reference to hypothesis 4 given in Chapter One, it could be illuminating to attempt to find out what components of tunes made the listeners prefer one tune to another; but that is beyond the scope of this research. SOUTHGATE (1907) says that in an emotional state, there are several components. He claims that there is not so much a definite feeling which can be categorized and analysed but rather:

> "..... an indefinite mood of which we are conscious but which it is difficult, if not impossible, to label and which is incapable of analysis."

GURNEY (1880) had complained of similar difficulties:

> "Music is perpetually felt as strongly emotional while defying all attempts to analyse the experience or to define it even in the most general way in terms of definite emotions."

However, much more recently YOUNG (1973) has considered that the nature of the musical experience hinges on 'the cognitive awareness of an inducing situation' but, invoking JAMES (1890) he posits that:

> "..... an emotion is not a purely cognitive experience, but an awareness of such bodily changes as palpitation of the heart, cold sweat ....."

However, it may well be that the time is ripe for a re-appraisal of the problem of what relationship exists between emotion and music, particularly in regard to melody and perhaps making use of parts of the method designed into this investigation.

Yet MEYER (1965), writing on the problems of depending on the evidence of the behaviour of a listener to music says that evinced behaviour can be quite misleading:

> "For conduct which might to an observer appear to indicate the presence of an emotional response might in point of fact be the result of a subject's daydreams, his observation and imitation of the behaviour of others, or his beliefs as to the kind of behaviour appropriate and expected in the given social situation."

Whilst those words warn of part of the problem in the possible enquiry mentioned above they also carry a caution to be heeded in the present investigation. Regard was, however, paid to the views by MEYER (op. cit.) and indeed expressed by others, and this led directly to the abandonment of any music, about which the subjects might have developed specific reactions based on generally accepted conventions; although unfortunately it proves impossible to ensure that the subjects are not at some point lapsing into daydreams. This has to be borne in mind when evaluation of results is being made.

That there is more to musical emotions than the 'cognitive experience' mentioned above by James is propounded by REID (1969) for whom musical experience is revelation. He agrees that there can be the ordinary perceptions in art; what is seen is defined in terms of 'describable shapes, colours, patterns, images, concepts'. But on another level there is an intuitive flash of insight, what LEWIS (1951) phrased as:

> "..... a miracle. Whereas we were blind we now see."

The intuitive nature of this insight was noticed by HOWES (1958) and bears directly on music as an experience, as something which happens to one. He suggests that the mind is, at first, at work gathering to itself all the impressions created by the music but then:

> "..... the new knowledge or the new thought always comes to you as a flash of light out of darkness. In the darkness, you have been busy accumulating information ..... but when the solution comes you are passive; it breaks upon your mind, it occurs to you, as you say: you see where a moment before you were in the dark."

The pupils who generated the melodies for this research had not, as far as could be ascertained, had any formal instruction in composition. It would seem reasonable to suppose that the only way in which they could then compose their mood

tunes would be intuitive; even allowing for trial and error there must have come that 'flash of light' which decided a child to use, or retain after trials, a certain note which seemed to be the only acceptable one. As far as the listeners were concerned, there surely had to be one moment when indecisions over categorizing a mood tune were put aside and a firm decision was made.

There would appear to be some agreement that the emotional stimulus preceding the musical experience is deeply implanted in the mind, and in particular, that area which is concerned with creativity. GHISELIN (1952) asserts that:

> "..... human creative activity is rooted in the general life principle of self-duplication."

and it may well be that this urge to rationalize the wish for self-duplication stimulates the composer to produce original work which embodies aspects of himself. GUTMAN (1967) sees that musical creativity is self-involving, and says that the stimulus for the creative process within a person, is 'an involuntary, automatic and compelling element' which is accompanied by 'strong emotions ..... involving not only the mental faculties but the totality of the person'. ROGERS (1959) says that man wishes to actualize himself and develop to the limit of his potentials. There is a paradox, however, in that the musical embodiment of what the composer is, may

not stimulate the listener to an awareness of that embodiment, as intended. The act of self-actualizing can come about surely only when the embodiment of the emotion in music is successfully communicated to a listener; otherwise it is difficult to understand that the self has in fact been actualized. From the viewpoint of this research, this may go some way to account for the apparent failures some children had in communicating. Either the composer was inefficient in embodying his self in the music or, if the potential for communicating the embodiment was available, the listener, for a variety of reasons such as boredom, inattention or confusions, could not re-act to the potential communication and effect it. In short, self-actualization can only be successfully accomplished when a rapport between composer and listener exists. SEASHORE (1938) may be adding to this argument when he says:

> "It has been said that what a man shall see in a landscape depends on what he is; so in music. The ideas and feelings which constitute the response are the creation of the listener in his own image."

It would seem that when a person's emotions have been stimulated, that person feels a desire to continue to have the emotions stimulated. GORDON (1961) says that creative people are compelled to go on inventing continually, being driven by hedonic response to know and

know again the thrill of their emotional satisfaction.

However, CRUTCHFIELD (1964) sees danger in this, and writes:

> "The person who sets out to create something in order to 'express himself' is unlikely to create notably. The aim is too self-conscious, too ego-orientated ..... The truly creative act reflects a spontaneous, unpremeditated, outwardly manifested expression of a person's processes."

It is thus seen to be probably inevitable that for purposes of this research, where the acts of creation called for did not arise spontaneously within the subjects but were at the behest of the investigator, the melodies created may not have been true expressions of the processes of the children; but then the dangers and shortcomings of all research which puts subjects under a clinical scrutiny are well recognized; but even so, these must be remembered as a contaminating influence on the findings.

As has already been hinted earlier, it is relevant to a consideration of the nature of musical experience to note that the part played by all the aspects noted above is not as private and personal to an individual as might at first be supposed. JASTROW (1928) observed:

> "The great majority of the psychic responses, the affective ones predominantly, move in a social milieu ....."

whilst BRIDGES (1932) went so far as to believe that not only are emotional development and social development closely linked, but indeed the former may even be an aspect of the latter. YOUNG (1973) emphasizes the effect of societal forces on emotion and says that there is a:

> "..... gradual change of the nature of overt emotional responses in accordance with training and social pressures. Thus emotional and social development go along hand in hand."

MUELLER (1951) also recognizes the influence of group feelings on the awareness of the individual to music. Writing on the subject of musical taste he remarks on the unending subjection of the listener to the reactions of all those around him; he is a 'participating member of a complex culture group.' With these contentions in mind, it was thought imperative that the tune composers should work on their melodies privately and in isolation from their colleagues. As for the listeners, whilst group auditions of the tunes had to be undertaken for purposes of economy of timing, the method of recording categorizations under examination conditions and on paper obviated any influence by strongly opinionated spoken responses on others. However, the effects of training and social pressures made before the research commenced could not be obviated, and must be borne in mind as experimental contamination of any findings made.

b. Ambiguity in Music.

The meaning which people ascribe to a communication of whatever kind, is indissolubly bound to their perception of what has to be communicated. At one end of the spectrum, it is obvious that if no means of perception is available, no communication can take place; the blind do not visually perceive the shape before them. At the other end of the spectrum, the blind person who has learnt to perceive in a tactile w a y of a tangible object may in fact be able to perceive more than does a sighted person whose visual appraisal of the object may perhaps be cursory. It would seem that what a person in fact appreciates in his environment is directly linked with the quality of perception he is able to employ. When a person is unable to perceive, or unable to perceive efficiently, however that may be defined, he fails to respond intellectually and we might further say, in agreement with ADCOCK (1964) that if no meaning is adduced, a person cannot really be said to have perceived at all.

In all our study of the music composed by the young children in the generating sample it has become evident that perception by children in the categorizing sample of the moods embodied in the music, displayed varying degrees of disagreement. It may be useful to speculate about the reasons which could have given rise to this situation. ADCOCK (1964) says:

> "The varied evidence of learning processes involved in the development of perceptual capacity could easily lead to the conclusion that all perception is dependent on learning. This is no more true than the older notion that we are miraculously endowed with full perceptual powers at birth. As with all psychological functioning, the truth appears to be that we are innately provided with capacities which develop under certain conditions."

However, it seems justifiable to infer that some perception does in fact depend on learning. For example, we learn to invert the already inverted image within the eye and thereby perceive objects to be 'the right way up'. We perceive a voice to be that of our mother, possibly because that voice has become linked with need-fulfilment. The speed of the learning and any decrement of the strength of recall of whatever feature of the environment, however, are infinitely variable quantities over the population and such variation must inevitably bear upon the perception of the intended mood of the communicated tunes.

Additionally, ADCOCK (1964) says:

> "..... perception depends on memory."

and since memory is a function also infinitely variable in man it is straight forward to assume that the pupils in the investigated sample perforce vary in their abilities to recall early stimuli relating to their perceptions of emotion.

It may be useful too, to draw a parallel between aural and visual perception. The perceptual phenomenon illustrated by the way that certain pictures change quite dramatically when they are stared at ..... these are referred to by ADCOCK (1964) ..... clearly shows how it is possible that the same set of lines can, under certain conditions, convey a quite different image. It would seem that an extension of this idea is possible to the aural perception of the tunes under review. May it not be that either the tune generators had a shifting perception of what they were attempting to embody or that the tune receivers were thrown into a doubt between two, and sometimes three, possible types of mood communications; or both? ADCOCK (1964) assists greatly in clarifying this concept when he writes:

> "This changing of the perception while the stimulus pattern remains the same poses quite a problem ..... What we are presented with is a stimulus pattern, and it is from this stimulus pattern that we try to reconstruct reality. We have said <u>reconstruct</u> because we assume reality is there in the first place, but we have to be very careful to remember that we cannot compare out reconstruction with reality itself because <u>we never know it except through our stimulus patterns</u>.

For the purpose of this investigation it is important to remember that each listener is faced with the task of reconstructing the reality of what the composer intended with the added complication that the intention of the composition

may have been to produce a mood tune which was in some way ambiguous; or he may have done so accidentally but legitimately.

Ambiguity in, say, poetry, is a well-known phenomenon and is discussed by REDPATH (1965). He looks critically at what functions are borne within poetry not necessarily because the poet himself wishes it, but because the functions are somehow innate within the poetry. The poem, he says:

> "..... may mean something different from what the poet intended it to mean, may mean less than the poet intended it to mean; may perhaps sometimes mean substantially what he intended."

He looks critically also at the reader of the poem and maintains that:

> "..... the meaning of the poem itself is neither more not less than the meaning it has for an intelligent and sensitive reader or for intelligent and sensitive readers who understand the language in which it is written."

In looking at the creator of the work and the reader of the work, Redpath seems to be indicating the scope there is for ambiguous information to be passed. CHARLTON (1970) presents an interesting view that he applies directly to music when, during a discussion on Susan Langer's views, he writes:

"..... the same piece of music can be used by different hearers or on different occasions as a vehicle for the conception or intuition of different emotions ..... a piece of music might be compared with

$$2(\quad)^3 + (\quad)$$

which we can fill in with our own arguments."

Both authors conjoin with EMPSON (1947) in the respect that he says:

> "'Ambiguity' itself can mean an indecision as to what you mean, an intention to mean several things, a probability that one or other or both of two things has been meant, and the fact that a statement has several meanings."

In the mood tunes composed by the sample, it is possible that all these alternatives apply. For example, a child embodying 'dreaminess' in his composition could be undecided as to whether he is to embody a pleasant sensation or an unpleasant one, possibly with 'nightmare-ish' qualities. Perhaps he might attempt a mixture. Perhaps a pupil does not use the same connotation of 'dreamy' as the investigator. She might perceive certain feelings aroused by a 'pop' star as 'dreamy'!

It seems likely that music is peculiarly subject to ambiguity by virtue of the fact that it takes place over a time span. Whilst a picture, a piece of sculpture, a panorama of country, is there completely of an instant to be perceived without the need for a passage of time, a musical

composition moves through time during its realization.

CHARLTON (1970) defines thus:

> "A piece of music is a change in sound which goes on through time."

Children's difficulties, like everyone else's, arise because not all the essential information can be presented in an instant. In music, the sheer impossibility of this is pointed by EMPSON (1947) when he says:

> "When you are holding a variety of things in your mind, or using for a single matter a variety of intellectual machinery, the only way of applying all your criteria is to apply them simultaneously; the only way of forcing your reader to grasp your total meaning is to arrange that he can only feel satisfied if he is hearing all the elements in mind at the moment of conviction; the only way of not giving something heterogeneous is to give something which is at every point a compound."

It is reasonable to suppose that not every child has the intellect sufficient to allow him to hold all the musical evidence in frame at the time final decisions are being made; neither have children equal capacity to make informed judgments from what evidence they have indeed held. DIXON (1972) makes a percipient comment which would seem to match the task any listener has in categorizing the mood tunes he hears. He says:

" Like perception, an identikit picture is built up from a given set of parts to resemble a partly unknown external reality. In its build-up, a number of factors play a part, actual clues to the real identity....."

but he recognizes the limited potential of the process

which can produce:

> ".....not so much a reflection of the external world, as the best possible match for this world which the user can make with the information available."

Dixon says that what actually comes out of an artistic experience for the perceiver results from appraisals but it is important to realize that:

> ".....there is a two-way interaction between the incoming information and the schemata, or organized knowledge, of what has gone before."

A musical note, or even several, is not likely to produce

instant information to a listener; it can have import for a listener only when, for that listener, sufficient sounds have been successively made to enable him to relate to an overall perception; and from that emanates the individuation of the art work. This latter process is entirely different from the former process during verbalization; as MEAGER (1965) has explained, in a work of art:

> ".....performance is evaluated as more or less worth having in itself and apart from any purpose it may serve instrumentally."

The problem is further deepened because whereas in verbalizing, the final meaning is an aggregate of several individual meanings given by each word or phrase in a communication, the meaning of a piece of music is not so derived. SWANWICK (1974) wrote:

> "In the case of music we have to learn to recognize the tonally produced conceptual schemata, the play of such variables as weight, stiffness, size and movement, before any unique and personal 'meaning' can be brought about that relates in any way with the intentions of the composer....."

and whilst it is conceded that Swanwick was at this point concerned with the acquisition of a cognition of musical characteristics by those for whom the knowledge would be novel, nevertheless the idea is capable of extension to the pupils of our sample; with the proviso that in their case the process of cognition is being applied not so much to find out what is acceptable in the ethnic group to which they belong, but rather to use all the knowledge that has been attained during life and use it to make an appraisal of the composer's intention.

EMPSON (1947) has a comment to make which is particularly applicable to the ambiguity found in the children's tunes. His comment is contained in what he terms 'an ambiguity of the fifth type'. In this he posits that artists may discover and refine their ideas as they proceed with their art work. It has to be admitted that the situation in which the pupils were put could not be expected to call from them the spontaneity which CRUTCHFIELD (1964) has alluded to elsewhere; but in an experimental situation the weakness is contingent with the process. Nevertheless, Empson's ideas can still be of use in our situation. He says that in a system of creativity by experimental process there can be produced in literature:

> "..... a simile which applies to nothing exactly, but lies half-way between the two things when the author is moving from one to the other."

In the shifting conception, it may well be that a composer blurs the limits of definition in what he originally set out to do, in trying to 'keep to his brief' as it were, and in so doing made suggestions bordering upon another conception and common to both conceptions in part; and so the pupil's categorizing would be left in some limbo, while conflicting doubts were evaluated before a final concept could be chosen.

It is also feasible that the pupils in the sample caused ambiguous interpretations for listeners in that, although there is not strict congruence between ambiguity and digression, they may have digressed. This could have been caused by limitations in performance consequent upon lack of instrumental ability. Alternatively, they may have, in true creative fashion, followed another route which unexpectedly revealed itself. Whilst many would argue for such digression, argue that George Eliot is fascinating largely because she digresses, many would argue that music adds a dimension through digression and the ambiguous feelings which may arise therefrom when it becomes apparent. Yet from the point of view of efficient categorization of a composer's intention, it is evident that such musical digressions must put a listener into a quandary. In these 'ambiguities of the sixth type' as Empson calls them, the listeners are now forced by the design of the experiment to make a choice and one only. Such a choice becomes an effort to justify what is now being heard and could well be antithetical to an embryonic concept

of what the tune, up to that point, was perceived as embodying.

If it can be accepted that categorizations which differ from the composer's intentions are not necessarily 'wrong' in the sense that 1 + 1 = 10 is patently incorrect, at least in a base ten calculation, but are legitimate because of an individual appraisal based on ambiguities acceptable as part of the aesthetic process, it is open to further speculation to be made as to why the intrinsic ambiguities are perceived at all; but these will have to wait until further data are available.

c. Reaction and Experience.

When a musical experience is considered, it is thought of as what happens in the mind of a listener when he attends to the music; the listener makes a response. In the matter of the musical response, it is worthy of note that REVESZ (1953) and SHUTER (1968) warn that to experience musically does not depend necessarily on having musical capabilities; clearly, to be capable of using a good technique does not perforce imply that the player will have a musical experience, although it is possible that it could help, in certain circumstances. Equally, confusion through the listener being considered 'musical' should be avoided. The response may be through feeling, although MEYER (1970) says:

> "..... not all mental responses are affective. We speak ofdis passionate observation, calm deliberation, and cool calculation. These are non-emotional states of mind."

and VALENTINE (1962) asserts:

> "..... it is possible for intense enjoyment of music to be experienced without the communication of ideas or specific emotions."

Where the response in fact, is affective in character, the listener may or may not enjoy it, but at least he responds. The response may take different forms. For instance, in a study of photistic visualizers, the musical experience was found by KARWOSKI et al (1938 and 1942) to bring about a mental picturing of coloured shapes by the listeners. As regards the composer, response may not always be to sound; WILLMAN (1944) suggests that a composer may be affected by the visual patterns he makes on paper. This would imply that the artistic experience of the music is therefore not entirely an emotional one. TITCHENER (1909) saw the response as simply either pleasant or unpleasant but WUNDT (1896) distilled three elements which he called pleasant-unpleasant, excitement-depression, and tension-release. LUNDIN (1967) says:

> "..... these atoms of experience could be combined with sensations to make up consciousness."

and it would seem this consciousness is the musical experience whose nature is here considered. It is relevant to notice views on what sort of input is needed for each pole of the paired reactions to manifest itself. As regards pleasant-unpleasant, LUNDIN (1967) says that the number of repeated hearings of certain music adds to the pleasantness; he observes that fewer repetitions of 'popular music' will be needed for pleasant experiences than for so-called classical music. Significantly, he says that further repetitions of popular music cause it to be appreciated as less pleasant than formerly. It is generally held that repeated hearings of 'serious' music have the opposite effect. WASHBURN (1927) suggests that the reason why pleasantness increased was the complexity of the music, the instrumentation and the form; and of these three aspects the importance of form in musical experience has been noticed by many authorities including SCHOEN (1940), LANGER (1953) and STORR (1972). What he called a 'preferential response' was noticed by LUNDIN (1967); as when a listener says he likes jazz, not Brahms; however, on judgments based on liking REIMER (1970) has a reservation.

Research has shown too, that in musical experience, individual responses can vary on the acceptability as 'pleasant' of the various intervals heard. This could, however, be based on criteria which vary not only within cultures but over time; VALENTINE (1913) wrote that:

"....one must expect great differences among individuals, though there seems to be a general agreement that to the modern ear, the Third is the most pleasing interval, whilst during the middle ages, the Fifth was probably the most popular, and with the Greeks, the Octave."

yet the research by VALENTINE (1913) could well be in need of up-dating if the taste of some, admittedly 'avant-garde' audiences is now the criterion. But the phenomenon of change of standards of what is acceptable is no new occurrence; indeed, sixty-five years ago, VALENTINE (1913) himself could record that:

> "..... there is ample introspective evidence that dissonant intervals, where pleasing, are sometimes felt as consonant ..... the above statement is not confined to the cases where the discords are heard as leading to a pleasant resolution. The impression occurs too when they are heard alone."

whilst by 1978 many audiences have so widened their vocabulary of 'learned relativities' that they accept new sound combinations in electronic music even where the pitch of individual notes varies from the traditional well-tempered scale.

Excitement-depression reactions may depend on characteristics within the music such as tempo, pitch, harmony and rhythm, states LUNDIN (1967). For instance he considers that the higher the pitch, the more the music is considered to be sprightly, humorous; the lower registers

tend to centre on sad qualities. These observations will clearly bear on the present research. The bi-polar reactions of tension-release have been seen by McLAUGHLIN (1970) as corresponding:

> "..... to those activities of the brain caused by mental and bodily events;"

Just as the intellect and the body are able to experience demands upon them, which create tensions, and can provide answers to those demands, the release of those tensions, so the musical experience can be, by analogy, a feeling of stress to be followed by resolution. BINGHAM (1909) considers one of the sources of stress-resolution is found in the relationship of succeeding melodic notes to each other, and suggests that feelings of tonality are not matters to be explained by recourse to mathematical explanation, but rather to what goes on in the mind of the listener. He says also:

> "..... the factor of experience is directly efficient in determining what tones shall be felt as 'related' ....."

and further writes:

> "When tone follows tone in such a manner that the hearer can re-act adequately to each ..... then the tones are not felt as discrete, separate, independent, but as 'related' to each other. And when finally the series of tones comes to such a close that what has been a continuous act of response is also brought to definite completion ..... the series is recognized as a unity, a whole, a melody."

and the unfolding pattern, perceived as arriving at a resolution, brings with it an intellectual release.

MOORE (1914) sees an element of the musical experience to be a struggle in the hearer between success and failure. This struggle hinges on the success of the listener in synthesizing tonal elements into a uniform complex. Just how successful the listener is in the synthesis decides the degree of success or failure that he experiences. The keenest pleasure will be felt in the most difficult syntheses successfully accomplished. FITE (1903) makes the point that there is a constant stream of these syntheses which lead to what he terms 'an equilibrium'; each 'equilibrium' he says:

> "..... is certain to be disturbed by the coming to consciousness of further capacities which call for further realizations ....."

However, in any consideration of the stress resolution experience, it is worth noting that there are no absolutes as to what is for all listeners the sound which produces stress and the sound which permits the hearer his 'equilibrium'. VALENTINE (1913) found a hierarchy of acceptance of the 'twelve intervals upon the piano within one octave'. He found that:

> "..... the pleasingness of an interval will depend not merely upon its degree of consonance, but also on the more or less vague suggestions of other notes."

Such a hierarchy must, in part at least, contribute to the widely varying levels of reaction which are part of the complex musical experience. Further, age seems to be a factor in the acceptance of intervals as agents of stress or resolution; the very young, says VALENTINE (1913 and 1914):

> "..... make no distinction between discords and concords ....."

and thus age may be an operative factor in the nature of musical experience and this will have a bearing on the way in which the listeners in the sample used in this research respond to what they hear. With the children's music, it may not be so much that many intervals used are difficult of acceptance in themselves; rather is it more the case of the juxtaposition of such intervals. However, later investigators have suggested that the process of attempting to label intervals at all creates difficulties. It was FARNSWORTH (1969) who stated:

> "Many theorists and composers are beginning to see that an interval can be evaluated only in terms of its context and that labelling certain [intervals as] consonant or dissonant is a stumbling block to musical creativity and appreciation."

and he maintains the strength of his view by adding that opinions on the matter vary according to the culture. He further supports his contention by drawing attention to the transience of concepts of interval-acceptance.

> "Indeed music history is in large part the story of the handling of innovations, of the gradual acceptance of what was once musically unacceptable."

In the sample of music produced by the children for this research, some bears the hallmark of convention but much is without doubt innovative in style, owing little melodically to history. Why children have wished to compose in this style may be open to conjecture. Admittedly, junior pupils have not had sufficient experience of living to conform closely or rigidly to musical conventions, but may it not be, as Freudians will accept, that they use their own very personal methods of setting up tensions which they release in an innovatory manner, a fulfilment which makes amends for the dissatisfactions of their lives? STORR (1972) however, warns that music:

> "..... is not a sublimation, although sublimation may contribute towards it, as it does for all the arts. There is a real sense in which the creative products of man are something SUI GENERIS: syntheses partaking both of the external world and of the inner world."

But the short-term experiences of life which children have had does not indicate that therefore there is not sufficient for them to draw upon in their embodiment of feeling in music. Indeed the contrary is true. The ideas of LANGER (1953) that music's function is more than to assist the 'occasional awareness' of feelings are followed up by STORR (1972) who conceptualizes music as a catalyst which

makes:

> "..... bridges between the external and the internal ..... by making a whole out of apparently disparate elements ....."

This, he says, forms:

> "..... a paradigm of that 'subjective unity of experience' towards which we all aim, but from which we are so often and so inevitably deflected."

That music is such a powerful agent for the mind to be able to attempt to attain that 'subjective unity of experience' is noticed by SWANWICK (1974) who claims that responses to music:

> "..... arise precisely because an abstraction is made for us which allows us to experience affectively a fusion of traces of past experience."

COPLAND (1972) shares this viewpoint thus:

> "It is the very nature of music to give us the distillation of sentiments, the essence of experience transfused and heightened and expressed in such fashion that we may contemplate it ....."

Much of the foregoing suggests that musical experience hinges on what has been during the life of the auditor; and many would consider this connection with a child's heritage

of experience a sufficient reason for encouraging his musical creativity and indeed for fostering it. But an indication that it can be more than this is made by SILBERMANN (1963):

> "Have we not been told frequently enough ..... that music is one of those forms of human creation which speak through the soul to the senses and the intellect; that it is not enough to say that music expresses feelings but that one must also say that it stimulates them?"

Could BENTLEY (1966) have had this idea in mind when he wrote of 'the understanding listener'? If so, it is relevant to notice what he says is the first aim of junior school music:

> "1. The aim of music education is to introduce the child to music as a live experience, and, according to his abilities to assist him to learn such skills as will enable him to take an increasingly active part in music making, and to become a more understanding listener."

d. <u>Communication and Understanding</u>.

Consideration of these aspects of the musical experience seem to dichotomize themselves as 'autonomist' and 'heteronomist'. In the preface to the account by HANSLICK (1957 revision) it is reported that his:

> "..... main object is the refutation of the popular and still prevalent theory that the feelings or emotions are the substance of musical sounds ..... He denies that music is a language of the emotions or, by implication, of persons, places, things, events or ideas .... he sides therefore with the autonomists ....."

Other thinkers incline to the opposite view which admits of music as 'a language of the emotions' (COOKE 1959) and a potential force in the arousing of the emotions (MEYER 1956). Whichever view is favoured, according to SCHMIDT (1910) and STUMPF (1911) the first music may have arisen from the communication of signals, messages vocalized over considerable distances, and if this be so, primitive music experience was subsidiary to the prime requirement of understanding the message. HOWES (1948) would appear to align himself with this view when he categorically states:

> "Music is a communication between minds .....
> a mental rather than a physical phenomenon."

He seems to consider the language and communication aspects predominantly and includes in his consideration of them the stength of meaning in music, carried by imagery and symbolism. In this research the position is taken that since children appear to be able to communicate certain moods, such as happy, sad, angry, comical and dreamy (LEGGATT 1974) through the medium of original melodies, it is self-evident that a communication of some sort has passed from the tune composer who transmitted the tune on a chromatic glockenspiel to the listener who received it by way of a recording on magnetic tape. It may be profitable to speculate on the nature of the communication, and the way in which it takes place.

In general terms, communication is taken to be the transmission of one person's thought by way of some sort of medium, to the mind of a receiving person. The content of the thought will be drawn from any part of the range of human experience and come about through the influence on the transmitter of a 'social force' (CHERRY 1959) and it will be modified by what that author terms an 'individual force'. It is, as the rhetorician recognizes, a desire in a person to move away from the polarities of 'I' and 'you' and adopt the more intimate 'we' with that word's implications for sharing and union; and it produces a movement towards a mutual sentience.

Thought is not restricted in transmission to the channel of human speech. A person may communicate in ways other than by organized speech; he may, for example, choose to use physical signs, gestures, or he may choose to draw pictures. Yet other persons may prefer to adopt clay or paint or sounds in music to convey what they are thinking. Clearly, there are great differences between the modes of thought transmission being used and equally evidently, great differences in the media being employed. Further, whilst it is almost taken for granted that thought is transmitted in speech and writing by an ordered syntax which enables ideas to be enunciated, it is not at all clear how ideas, thoughts and concepts can be communicated through other media; for example, music. One method, for instance, is referred to by HOWES (1958) who writes:

"There would seem to be other possible modes of thinking in music:

a) intuition, which is the primary act of mind in all kinds of knowledge ....."

and those acquainted with the Piagetian model of mental development and the concept of 'intuition' as it could influence the pupils used in this research, will find it acceptable. Indeed, HOWES (1958) says that intuition is:

> "..... the fundamental act of mind ....."
> that is, direct and immediate apprehension
> ..... the process of artistic creation .....
> the tune occurs to the composer, he does not
> 'think it up' though he may, like Beethoven,
> work upon it afterwards ....."

There is value, however, in first considering how it comes about that spoken language conveys the speaker's thoughts. Without going into the step by step development of speech from physical gesture to enunciated word, it would seem clear that people have come to accept that sounds organized in a very sophisticated pattern can, if both parties to the attempted communication agree to use a common pattern of symbols, embody thought. The important and crucial point is that both speaker and listener share a common knowledge of the attribution of a particular sound to a particular semantic concept; for example, 'Go!' is quite unequivocably an order that one person shall move himself away from another person or place. Such an understanding of course, is accepted as resulting from learning; it cannot

be innate for how then could 'Allez!' or 'Gehen Sie!' be admitted also, for the action instructed?

Is there then, some common knowledge to be a bond between an artist in whatever medium, and his client so that the client will be able to receive the message embodied in the art product? LANGER (1969) points up the problem when stating:

> "Logically, music has not the characteristic properties of language --- separable terms with fixed connotations and rules of syntax for deriving complex connotations ..... music has no literal meaning."

while MEYER (1970) follows this up, taking matters a step beyond when he writes:

> "The debates as to what music communicates have centered around the question of whether music can designate, depict, or otherwise communicate referential concepts, images, experiences, and emotional states."

Herein lies the problem for this research too, whereas people will largely agree on the implications of a word and secure from it knowledge of, perhaps, a concrete object, for example, 'tiger' or 'water', people would be found not to agree upon, say, what Mendlessohn wished to embody in the 'Midsummer Night's Dream overture, UNLESS THEY HAD PREVIOUSLY BEEN INSTRUCTED. And an added problem noted by VALENTINE (1962) is that:

> "..... the same piece of music may give one kind of impression at one time and a different one on another occasion, even almost immediately after at the same sitting ....."

HOWES (1958) clears up the matter of what music probably communicates and anticipates what LEGGATT (1974) found possible when he wrote:

> "..... music is a kind of knowledge and the object of its knowledge is states of mind, especially emotional states. Music is a formal knowledge of emotion through sentience ....."

This research centres on the 'formal knowledge of emotion' in and through music and the investigator contends that since as earlier stated, children were able to compose tunes embodying stated moods and the tunes could be correctly categorized by listeners with more than aleatory success, it is apparent that both the tune transmitters and the receivers shared a common awareness of what the sounds implied.

It is fair to enquire then, what it can be that is communicated, what the message is. If the music be vocal, it would seem obvious that the words will usually convey an unambiguous communication; no doubt that what the listener understands will be largely what the composer understood when he set the words. The unambiguous message however, may not be very much to the credit of the music. It is to the point to ask if the music, without the words being

heard, would communicate the same message. If music is heard purely as sound, with no vocal embellishment, would CHERRY (1959) be supported when he says:

> "An artistic mode of expression, such as music ..... represents a 'language'; through this the artist instills ideas into us."

The test has to be a personal one; each listener must be his own critic and put himself in the position of LOWERY (1945) who defines one of the functions of a critic as:

> "..... to listen to performances of compositions with a view to the assessment of the work performed and the extent to which the performer reveals any special message via the performances."

HANSLICK (1957 revision) was however quite specific in his view that musical experience was not due to some particular metaphysical effects of melody, like being in some way beyond account and mysterious. He declares:

> "The specific effect of melody ..... is the inevitable result of the musical factors united in ..... particular manner."

He further asserts that certain rhythms, characterized by brevity or length, certain progressions whether diatonic or chromatic have their own effects. Without being so explicit, STORR (1972) supports that view which holds that:

> "..... the same kinds of musical phrase and interval are used by different composers to express the same kinds of emotional meaning."

The immediate problem is that the elements of the music have no <u>precise</u> import; there is no lexicon available wherein the listener may investigate what a composer meant when he wrote what he did. HOWES (1958) underscores the problem thus:

> "You cannot refer notes or chords to definite events as you can words or concepts ....."

and this is echoed by COPLAND (1952) who, in an apt phrase, cannot find an 'esperanto of the emotions' in music. Yet he suggests that there is information to be received from music:

> "But to return to my absorbed listener. The interesting question then, is not whether he is deriving pleasure, but rather, whether he is understanding the import of the music. And if he has understood, then I must ask: WHAT has he understood?"

The difficulty in answering explicitly is well recognized. REID (1969) says:

> "..... how impossible it is to state clearly and adequately in rational language the content and meaning of art which has to be known in its own way ....."

As regards the feelings aroused by music, SOUTHGATE (1907) draws a distinction between trying to describe them with words which are efficient only as symbols which convey the 'workings of the intellect'. He says:

> "..... but we have no adequate means in language of expressing the subtle and complex flow of the feelings."

It may well be that the particularly complex nature of the musical experience is itself responsible for the listener's difficulties in analysing his feelings and understandings. McLAUGHLIN (1970) refers to the 'mysterious moving quality of music' and suggests that this is in itself enough to cause:

> "..... the difficulty that many people find in putting the experience of music into words."

Both SEASHORE (1941) and HOWES (1926), in their efforts to throw light on the nature of the musical experience, use words like 'sincere, not sentimental, self-propelling, creative of imagination and not cliche-ridden' but they earn themselves no congratulations from LUNDIN (1967) because he says there is no measure of what such words can mean, nor is it known what they mean. STORR (1972) suggests that the reason it is 'notoriously difficult to describe in words' may be because:

"Music differs from the other arts in that its content has no obvious association with ordinary human experience ....."

MEYER (1970) makes it clear that what is understood, what is meant, is not to be found only in the music itself. He says there is nothing to be gained from asking what the 'intrinsic meaning of a single tone or a series of tones is'. He says that they are important in the chain of communication:

> "..... only in so far as they point to, indicate, or imply something beyond themselves."

The 'something' would seem to be a state of mind, a feeling or series of feelings, which, as HOWES (1948) says are symbolized through the musical sounds. In this respect then, music has become a language, he says, because all those who hear it use 'imagery in the process of thinking' and the mind becomes filled with:

> "..... a rich mass of more or less loose ideas in a simple concrete image."

Since the music is responsible for the listener's imaging it seems axiomatic that no new sentience can be created in the listener; he must come to his music with a sentience ready to be involved by and in the music. COPLAND (1972) says that Beethoven's music:

> "..... awakens moral ideas that are already in us. His music cannot persuade: it makes evident. It does not shape conduct: it is itself the exemplification of a particular way of looking at life."

LANGER (1969) however, does not share this interpretation of what music does, for she maintains that:

> "Just as words can describe events we have not witnessed, places and things we have not seen, so music can present emotions and moods we have not felt, passions we did not know before."

Yet the analogy between what 'words can describe' and what 'music can present' may be thought to be an imprecise one. A power vested in words is that they can limit. 'Happy' immediately removes 'omnibus', 'foot' or 'scalding' from consideration. It also removes thousands of other words and meanings from the mind. Yet music, on the other hand, sets the mind roaming amongst all the stored impressions and amongst the stored music garnered during a lifetime. Who can say which impression or indeed, which impressions, are those which categorize the music? Furthermore, because words have this limiting power, original combinations of them can be assembled to present a totally new concept, even one of which reason at any other time would forbid acceptance; consider any of Edward Lear's nonsense verse. Yet one does not have to be strongly sceptical to doubt whether a new arrangement of the progression I IV V I played by a hitherto perhaps unused combination of instrumentalists (tuba and pan-pipes?) could implant a previously unknown

and unexperienced feeling in a listener.

Yet it would seem reasonable that LANGER (1969) would gain more general support for her view that the nature of the musical experience rests more in a representation of known feelings, what they are like, what form they assume. HOWES (1958) refers to this matter of the importance of form:

> "..... music is a symbolic form and therefore must have what the semanticists call a referent, something to which the symbol refers."

but says this brings the meaning of communication no nearer a firm declaration. For SWANWICK (1974), conscious of the problem of meaning in music, it is a pre-requisite that the listener must learn to interpret:

> "..... the tonally presented conceptual schemata, the play of such variables as weight, stiffness, size and movement, before any unique and personal 'meaning' can be brought about that relates in any positive way with the intentions of composer or performer."

and such a view is, of course, compatible with the view that what music may be held to 'mean' is also a matter of the culture in which the listener no less than the composer, finds himself. LUNDIN (1967) and MUELLER (1951) amongst others, have drawn attention to this. When such interpretation has been learnt, it is said by WEINSTOCK (1953) that

"..... a symbolic, immediate and untranslatable presentation to our comprehension and response (because) Its power resides in its unique ability to dispense with portrayal, depiction and exegesis, to strike directly to the mind and the heart by symbolic articulation."

Yet CHARLTON (1970) cautions that a piece of music:

> "..... can be used by different hearers or on different occasions as a vehicle for the conception or intuition of different emotions ...."

and he draws an analogy with some algebraic expressions whose missing terms can be completed with alternative quantities (as remarked upon elsewhere.)

The question posed by COPLAND (1972) to the listener "WHAT has been understood?" may not be capable of closer clarification. It may too, be worth adding that symbols are open to different interpretations by different people, as W.S. GILBERT made plain. (See footnote).

W.S. GILBERT. "Angela: an inverted love story." An English invalid, unable to leave his room above a Venetian canal, was thrown a stem to which two flowers had been bound by the young girl living opposite. Alas! she intended them as a symbol of her one-ness with him in understanding his plight, not, as the invalid supposed, of their unity in love.

e. Cognition and Feeling.

At the end of the previous section, it was stated that it is possible for symbols to be variously interpreted by different people. This is referred to by HOWES (1948) who comments that in music:

> "..... a symbol stands for a rich and not precisely determined content of meaning."

He maintains that the musical symbol is capable of 'immediate apprehension' and he claims that a 'great wealth of meaning' is carried in the symbol. The important part of his observations, and one which bears upon the investigation in hand, is that within the meaning are two elements, one intellectual and another 'charged with feelings and values'. HOWES (1948) says that because of the intellectual element, music through symbolism, conveys knowledge. No-one has succeeded in defining the content of the knowledge, gained during the musical experience; rather does one sense the effect of the knowledge. An analogy might be with the wind which cannot itself be seen but its effect in causing trees to bow is evident. The nature of the experience in the view of COPLAND (1952) however, is that the knowledge:

> "..... brings with it an element of self-discovery ..... a part-answer to the question 'Who am I?'"

Whilst HOWES above, argues using the music as his vehicle, LOWERY (1945) regards the mental state

experienced by listeners. He shares the same view as HOWES but adds to it. He builds a model in which he places the listener becoming aware of the music, being attracted or repelled by it and, if the former, being attentive to the continuing music. He terms these three features of his model cognition, affection (i.e. feeling) and attention. LOWERY (1945) points out however, that:

> "..... it must not be supposed that they occur in isolation; rather that they are all present at one and the same instant, being interdependent, but varying from time to time in relative predominance."

MEYER (1965), talking of the physiological response during musical experience, links with the previously mentioned idea of attention, when he says that listeners bring to their musical listening, definite beliefs about what music can do if it has the listener's attention. He says that how a listener responds to music can be decided 'Even before the first sound is heard'. To the writer this would seem to do a disservice to music, as it is implied that the listener's 'mental set' decides his response, rather than what the music has to offer. This savours of the dictum: 'I know what I like and I like what I know', and perhaps matches it for bigotry.

Yet there is a sense in which the listener must make preparations, albeit subconsciously, for being

ready to experience musically. Both DUFFY (1957) and LINDSLEY (1957) have looked at this within the meaning of the term 'activation'. It would seem crucial in any consideration of the nature of musical experience, to accept that the listener shall of his own volition make a decision that he will allow himself to respond, to be activated, by what he hears. YOUNG (1973) enlarges the concept of activation. He says:

> "..... when a latent, emotional conflict is activated there can be an acute affective disturbance --- a manifest feeling or emotion. The phrase 'Let sleeping dogs lie' implies that emotional dispositions can be dormant or activated."

Such mental preparation, willingness to be motivated to attend, must surely be central to any view that music, if given attention, makes some form of communication, involves some sort of communion between composer and audience. 'There are none so deaf as those who won't hear'. Further, it can only happen under conditions of positive activation that music, if it has meaning embodied in its sound, will, as SWANWICK (1973) says, make sense to us, that it will communicate some meaning.

At this point and digressing but little, it is worth making abundantly clear that many investigators in the psychology of music have maintained that music appeared to suggest to listeners certain feelings which could be designated by words, and it may be that for some, this has a connection with the concept of 'meaning'. REIMER (1970)

says:

> "The 'meanings' available from an art-symbol are never pointed to outside of itself, but are functions of the expressive qualities embodied within it."

However, it may be worth emphasizing that often, such characteristics of music as being 'sad' or 'cold' or 'yearning' have been the result of either subjective assertions by musicologists or else have been the product of a composer's own communications to his listeners, often because an impressario required notes for a concert programme. Some communications may also have been in the text of the song he set, or in his instructions to his players or even in the title. Following from this, certain other writers have found supporting evidence in the alleged way that particular intervals have indicated the composer's thought, (e.g. COOKE 1959). Without at this point substantiating disbelief that such interpretations are rational, the researcher is firmly of the opinion, that there is something within the music itself which, although it may not be essential to some enjoyment, appreciation, by a listener, gives clues to the thoughts of the composer (see footnote), something not dependent on song words, instructions to

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But STORR (1972) has this to say: "There are those who maintain that musical patterns have no relation to human emotions, and that our appreciation of music is purely aesthetic. In this view music has no meaning outside itself and the listener's enjoyment of a musical work is the consequence of his appreciation of its structure."

On this basis, it may not matter to some whether or not they receive clues to the composer's thought.

performers, programme notes or titles. This can come about it is claimed, because music, as LANGER (1969) says, is formulation and representation of emotion, of mood. She says that people can understand the feelings embodied in music without actually having them; and she says that people can respond to emotion and moods not previously felt.

LANGER (1953) made clear that:

> "..... the function of music is not stimulation of feeling but expression of it; and furthermore not the symptomatic expression of feelings that beset the composer but a symbolic expression of the forms of sentience ....."

This position would seem to be opposed to that adopted by GATEWOOD (cited by ORTMANN AND VALENTINE 1927 and 1962) who compiled a list of the possible effects that music might have on a listener, such as causing sadness, seriousness, amusement. As SWANWICK (1973) observed:

> "The main difficulty lies in asking people how music makes them feel."

PAYNE (1973), in thinking parallel to this, wrote:

> "Whilst it is evident that the listener responds most immediately to the emotional aspects of the music (its aesthetic character and its emotional subject matter), there is no firm evidence to what this signifies in terms of his experience --- whether he actually experiences either or both of the emotions, or whether he is merely interested in them. There are indications however, that where the music is enjoyed scme aesthetic emotion at any rate will be experienced: to enjoy music, in fact, IS to experience aesthetic emotion."

SWANWICK (1973) suggested an alternative approach might be to ask:

> "What is the music like?"

although even in this line of investigation, because of subjective semantic interpretations, it may become necessary to limit the field of response to what can be shown to receive general acceptance over most responders.

4. Conclusion.

In general, the experience undergone by people when they hear or make music is compounded of many aspects and any single experience may consist of one or several of these aspects simultaneously. The response may be purely motor; the listener is urged to move limbs or the

whole body. Instead or as well, he may become excited, stirred or quietened. He may think of what to him is beautiful in the sounds he hears or the music forms he perceives. Again, the listener may have images of other times, other places, other people brought out of his store of memories; or he may have feelings, moods or emotions to experience again. Alternatively, the music may be purely 'background' to allow completely unrelated thoughts to occupy the mind. This view is expressed by FARNSWORTH (1969):

> "..... for most people the real essence of music lies in the fact that it gives each person an opportunity to project his private experiences through his own personal images or even to listen without trying to elicit images of any sort."

Compatible with that statement is the view of MEYER (1965) when he says that the way people behave relative to the music they hear:

> "..... is differentiated largely by custom and tradition. It varies from culture to culture within a single culture. This does not mean that there are no features of behaviour which are natural and widespread. In all probability there are."

As the above shows, the concept of 'meaning' in music is most diffuse and ambiguous. It will require attention later on.

CHAPTER THREE

Commentary on the Original Tunes.

A. Introduction.

Although the investigator's main concern was a study of the effect of various musical elements such as pitch, rhythm and speed on the perceived moods of tunes, it was thought worthwhile to comment musically upon features of some of the tunes themselves as samples of melodic composition by young children. Not all the observations made could be objective; and indeed, even where they are, it is probably not legitimate to make generalized inferences, although possibly hints could be taken as a basis for any further enquiries.

It is apparent that young children are competent to devise their own melodies without recourse to specific instruction on what "rules" should be followed in melody writing. In any case such "rules" as may be propounded are

merely the codification of general observation and as such can serve only to foster imitation, whereas some originality is the hallmark of true creativity; and whilst "rules" may almost guarantee that a melody will be accepted in the sense that it can be accepted as being "like" other melodies, the truly created melody does not aim primarily to be accepted in any other way than as a demonstration of what, for instance in this research, "anger" may be like for the composer.

It is also apparent that young children are able to memorize their melodies for repeated performance. The investigator occasionally made accidental errors during the recording of pupils' melodies on tape and found that when the fault was being rectified, the replayed tune was essentially what had already been heard. Whilst the memorized playing of short ostinati is often accomplished by junior children during ensemble performance, their ability to repeat "through-composed" tunes from memory may not be so well known.

An outcome of an examination of young children's melodies reveals a surprising degree on the one hand, of conformity to accepted norms and on the other hand, of momentary bursts of uniqueness. Indeed, in some instances, a more sophisticated tune creator might hesitate to employ certain devices, even allowing for some accidental effects caused by technical inexpertize, perhaps through lack of courage. The child, relatively inexperienced in what

criticism people will make, therefore does not fear it; and perhaps cannot therefore be called courageous but perhaps he could be termed ingenuous or innocent?

The plan followed in the examination of certain melodies was to consider them as illustrative of the wide divergences and the variety to be found in young children's tunes. A tape recording has been made by editing some of the eighty tunes used for this research and this tape is enclosed within the covers of this volume. It is suggested that readers of what follows now, should play the recording tune by tune as each is referred to in the text. It should be noted that the numbers allotted to the tunes are those originally given to the 300 tunes first collected. They do not follow an ascending sequence from tune number one, but occur in random order according to the requirements of the text. It is further suggested that each exemplifying tune or group of tunes be played <u>after</u> the relevant section of text has been read. In order to augment the effect of sound, a manuscript copy of each tune considered in the text is given. It is necessary to admit that the written version of what is heard can only be in many cases a subjective approximation of part of what is heard, although every effort was made to transcribe pitch accurately.

B. Criticism of the music.

1. When a graphical representation was drawn and this is given in the appendix, showing the range of notes employed by the children, it was found that there were some peculiarities which may not have been due to chance, in some cases. It was found that while there were instances of all the possible 21 chromatic note range from B to octave G above being used, an extremely limited range might sometimes be employed. The first melody to be heard uses no more than a minor second throughout whilst the second is full range. The first tune was claimed by its composer to embody the "angry" mood, the second the "comical" mood. In the samples recorded, "angry" tunes appear to be more restricted in choice of range than "comical".

(Play no. 20, then no. 9.)

2. The graph mentioned above also illustrates the pitch employed by the children. As might be expected sometimes the tune was mainly low down, sometimes mainly high up and sometimes it was found in the middle register. Reference to the appendix will show some pitch patterns. For instance, it appears that Angry and Frightened tunes tend to embrace mainly a low pitch, whilst Comical melodies tend to be located more in the upper register. It should be stressed that it is possible that were a different type of instrument used, a different pitch/mood relationship might be noted.

(Play nos. 17, 54 and 282.)

3. Speeds adopted appeared to vary both within and between moods. The mean speed, as measured by Maelzel metronome, for Comical tunes was 146.25 whilst Frightened tunes and Sad tunes were measured at MM = 105.5 and 101.31 respectively. Angry and Dreamy tunes occupied middle positions, with Angry only eight points of MM scale below Comical. Amongst the slow, medium and fast speeds found, the next tunes designated by the composers as "frightened" for the first two and "angry" for the third, were noted:

(Play nos. 80, 221 and 44.)

4. Another feature was the "time-elapsed" duration of the tune. This ranged from the two very briefest at 1.8 seconds each, to the longest at 38.6 seconds. The examples given were intended by their composers to embody the Frightened, Dreamy and Sad moods.

(Play nos. 204, 114 and 78.)

5. In the matter of the pulse of the children's tune, description came up against insuperable problems resulting from the perceptions of different listeners. Some attempt (not reported) was made to secure reliable evidence on this facet of the music, but revealed large areas of disagreement. The tunes to be played have been assigned a pulse description by the researcher, but no claim is made that the pulses designated are "correct"; they are only <u>his</u> perception of the pulse. However, if it can be accepted that the investigator used the same criteria over all the tunes

assessed, then it is apparent that children have access to many pulses although it was felt that duple pulse appeared over the 80 tunes used, to be strongly favoured. The tunes to be heard were classified by their composers as Dreamy, Frightened and then three Angry ones.

(Play nos. 12, felt to be duple;
121, ... triple;
32, ... mixed pulse;
89, ... 7/4)

6. The complexity of tunes was varied from the use of minimal resources to many. Tune no. 65 already heard contained four notes only, and was included in the sample having been correctly categorized as "Frightened" by 27.9% of the listeners. Other tunes were quite complex. The example to be heard appears to contain:

a. All but three notes of the available number of 21.
b. A mixture of pentatonic and chromatic movement.
c. Step-wise movement of twelve notes within 5 semi-tones, but a disjunct soaring movement of 18 semi-tones span, and a plunging series of leaps of like range.
d. Mainly one beat and half beat elements but to include dotted rhythm and, close to the end, either two triplet groups or possibly a brief pulse change to triple.

(Play no. 31.)

7. It would be difficult, and perhaps not possible anyway, to read into the overall shape of tunes, anything of significance. HEVNER (1937) warns:

> "Differences in expressiveness caused by the rising or falling of the melodic line are not clear-cut, distinct, or consistent ....."

However, one tune amongst several others appeared to be deliberately fashioned with some succeeding phrases interlocking with the preceding by one note each time, and, the pattern having been set, it is broken by causing succeeding phrases to follow each other closely but without this feature. The whole composition coheres by virtue of a constantly undulating pattern with few perceptible leaps. The tune is said to be "comical" by its composer.

(Play no. 9.)

8. The movement employed appears to be chromatic and diatonic and may occasionally be very disjunct, sometimes with spectacular leaps and occasionally with the tritone. Is it only fortuitous that in all 80 tunes the investigator could find only two cases of this interval?

At other times, the movement is wholly smooth.

(Play nos. 82: chromatic, range 4 semi-tones, said to be "frightened" by its composer.

56: diatonic, firmly in the keys of G and C major with two tonics, two dominants and final cadence well-founded on resolution of implied dominant seventh!

103: upward leap of a seventh.
159: downward leap of a seventh.
165: leap of a thirteenth.
39: tritone.
110: triton.
114: almost all stepwise.)

9. Considerable rhythmic invention seems available to children and although not all the subtleties can be committed to paper, the recordings illustrate them.

(Play nos. 146: perceived by the researcher as triplets; said to be "angry".
213: of "four-square" design where the rhythmic sequences seem to provide a homogeneous structure; said to be "comical".
80: features the quarter-note; said by the composer to be "frightened".
222: syncopation in a rhythmic sequence; said to be "frightened".)

10. Children bring feeling or expression into their tunes by varying the level of sound, playing with greater emphasis or with less, and also by varying speed. Whilst it has to be accepted that many observed speed variations probably result from insufficient motor skills in the use of the particular type of instrument employed, there were instances where it was felt that speed variation was deliberate and important. Such a tune is now included:

(Play nos. 99: fairly noisy.
102: quieter.
160: speed variation.)

11. Tunes may attain length either by virtue of a developing, unwinding character or by the use of short elements which are repeated. The latter method is illustrated now:

(Play nos. 89: one element; said to be "angry".
34: two elements; said to be "comical".)

12. The final example is included as a piece of pure self-indulgence, but it appeals to the researcher for several reasons. It appears to him to be well designed in 16 bars, which include eight two-bar phrases. There is a perceptible break at the half-way. The tune appears to be pentatonic throughout, using only the upper bank of glockenspiel notes which correspond to the black notes of the pianoforte. The whole composition has a lilting, swaying character with undulations exploring the whole note range available. The one feminine ending at the end of the third phrase seems happily placed. The composer says that the tune is "dreamy".

(Play no. 172.)

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CHAPTER FOUR

I. Design of the Experiments.

It was decided to consider in the investigation some of the features thought to exist in the communication of mood through children's original tunes. The features eventually chosen were pitch, rhythm and speed. Some of the preliminary procedure adopted followed exactly that used in the earlier research to which reference has already been made. (LEGGATT 1974), as this has shown itself to work well and had been straight forward in administration. That procedure is now quoted in part:

"Five moods had to be decided upon for the investigation. These were identified verbally as:

Angry, Dreamy, Comical, Frightened and Sad.

These words were chosen since from an earlier small pilot experiment, they had revealed themselves as being those least likely to be open to semantic confusion in terms of the artistic non-verbal meaning children might or might not associate with the verbal meaning of the words; although they were NOT chosen to be mutually exclusive. It will readily be seen that 'sad' and 'dreamy' could musically lie reasonably near whilst 'angry' and 'comical' could in some respects be anticipated to have some musical affinity.

It was important that since communication purely through melodies was being investigated, certain variables other than strictly melodic should be controlled so as not to contaminate findings. For instance, were pupils to have a free choice of instrument it is possible that undue advantage could have been given to a child who could play the piano as opposed to a child who could play only a school tuned percussion instrument. A child who could play, say, an oboe, might almost have been guaranteed success in communicating sadness, although he might equally have been hampered in trying to communicate anger.

With this in mind, it seemed reasonable to require each child to use one specified type of instrument. The instrument had to be technically easy to play, requiring only the minimum skill and preferably one with which the pupils were already familiar. It was decided therefore, to use chromatic glockenspiels. Further, children were not permitted to use the instrument undamped; in this way, no special effect could be gained for a tune. However, a small number of children used such force that an effect similar to undamping was obtained.

Each child was invited to make up a melody, the instructions being qualified by one of the five descriptions detailed above."

(Note: the descriptions were the names of the five moods).

"It was explained that each melody had to be one that no-one had ever heard before. Some children said it would help them if they could have the use of pencil and paper and this was allowed. They were permitted to use their own method of annotating the music in such cases.

Each pupil went to an empty room and there worked alone. He was told that there was no time limit and that as soon as he was ready, he could return to the investigator to have his tune recorded on magnetic tape. When he came to have this done, he was always allowed a short practice. No other instructions were given ..... At the end of the recording, each child always heard his tune played back to him but, of course, no alterations were made. Although this procedure extended the time needed to take recordings of the music, it was felt necessary in order to secure maximum interest and co-operation of the pupils. Several days elapsed before any particular child returned to compose a further, different melody .....

It was recognized there might be a danger in asking every child to begin with, say, a 'dreamy' tune and then to compose, say, an 'angry' tune and thirdly, perhaps a 'sad' tune. It is possible that as pupils became more sure of themselves they might have become more successful at communicating their mood and this could distort the findings. To avoid such practice effect, it was arranged that there should not be a preponderance of any one type of mood done by children as their first effort, nor in any other position in the five moods worked upon. For these reasons, a random arrangement based on Latin Square technique was used. Twenty identical Latin Squares were set up on the basis of the five moods named, to give 100 rows of five. Each mood row was then assigned at random to each of the 100 children in the sample."

From the tunes obtained, it was planned to obtain further magnetic tapes so that on each tape, one of the three characteristics noted in the hypotheses, viz. relative pitch, rhythm or speed, would be suppressed.

These tapes would be produced by the researcher, not by the children; how it was to be done is explained later. This procedure of suppressing one element has been commented on by HICKMAN (1975) who wrote:

> "The principle of holding steady some variable in an aesthetic context is validated by MOLES (1968)."

The rationale behind the procedure is that if a tune is communicated equally well, whether a particular characteristic is there or not, then that characteristic is not essential to the communication. Conversely, if a tune is not communicated equally well, when a characteristic is removed, then that characteristic must be influential in the successful communication of the mood; and in some way both parties to the communication, composer and listener, recognize the indication of the characteristic. Therefore tapes were prepared as follows:

1. <u>The Master Tape</u>.

Adopting the procedure already quoted above the researcher was able to obtain 300 original melodies from 30 boys and 30 girls, making only minor amendments to the original Latin Square to cater for a smaller number of pupils. There were thus 60 of each of the five mood tunes Angry, Comical, Dreamy, Frightened and Sad. The 300 tunes were categorized by other pupils from second year classes, 46 boys and 55 girls being used for this purpose. For this process each listener, over several occasions,

was given a uniform, prepared answer sheet. Each listener was required to write down in numbered answer spaces a single letter chosen from 'A', 'C', 'D', 'F' or 'S', these letters being the initial letters of each of the five moods under review. Children were told to use capital letters like the sample ones given by the investigator on the response sheets, because previous experience had shown that if lower case letters are used, there can be confusions between some, viz. between a manuscript 'a' and a manuscript 'd'. It was thus a simple matter to mark these responses objectively, from a master answer sheet on which had been recorded by the investigator the mood intentions of each tune generator. A count was made of the number of categorizations made by the listeners which agreed with the intentions of the composers. After a statistical test, involving the formula:

$$2SE = 1.96 \times \sqrt{npq}$$

where: n = the total number of trials
p = the theoretical probability of a trial being correctly categorized
and: q = 1 - p, the probability of a trial being incorrectly categorized

those tunes which were categorized correctly above random level at or below 5% were noted; the remainder were considered as having no further use in the investigation and were discarded.

Of the tunes found usable, 16 of each mood were chosen, giving 80 tunes altogether over the five moods. The method adopted in order to decide which should be chosen was to take those which had the greatest frequency of categorization by the listeners. The tunes remaining, despite the fact that they had demonstrably communicated, were discarded and not used further.

The next step was to commit all 80 tunes to music ms. paper, so that the three modified tapes could be produced.

2. Modified Tapes.

Before these tapes were produced, the researcher listened frequently to the Master Tape, following the 'score' simultaneously. Practice tapes were made and the method of making them refined after checks. It was found possible to re-record each of the 80 tunes from the open-reel original recordings made by the children on to a cassette tape. Each tune was re-numbered during this operation, so that the selected tunes from the original 300, each of which had, of course, been numbered consecutively from one to 300, were now numbered one to 80. This was done in order to simplify later reference.

The researcher now had the facility to play back the tape of 80 tunes on a cassette player. It was

found possible to use an earphone to listen to the original tunes whilst simultaneously making certain of the Modified Tapes, the researcher himself playing a glockenspiel and recording the result on the reel-to-reel machine which could not detect the original tune being listened to through the earphone.

As earlier stated, three modified tapes were produced and details of these follow.

a) Rhythm Tape:

The function of this tape was to enable an examination of the importance of rhythm in the successful categorization of each of the 80 tunes to be made. The component to be removed was therefore, the rhythmic one, but the original pitch, both relative and absolute, as well as the original speed would be imitated. It was a simple matter to secure correct pitch, since the original notes chosen by the composers had been committed to music ms. paper and could thus be played straightforwardly. The speed component was first checked aurally by listening to the original recording and when the tempo had been mentally absorbed, each modified tune, with every note now spaced equidistantly in time from the immediately adjacent notes, one on each side, could be recorded. In this manner, every rhythmic feature, including metre as perceived, was removed. Additionally, care was taken to imitate as nearly as possible, such incidental interpretative variations as strength of percussion adopted,

sforzandi,accelerandi and decelerandi. This modified tape was labelled 'P'.

b) Pitch Tape:

The function of this tape was to enable an examination of the importance of pitch in the successful categorization of each of the 80 tunes to be made. The component to be removed was, therefore, pitch. This was a straight forward operation, since the only note used was 'G' above middle 'C'. The investigator was able to use an earphone through which the original melody could be heard. This reference enabled him to imitate rhythmic features incorporated in the melody and to adopt speeds, percussive levels, sforzandi, accelerandi and decelerandi with as much accuracy as was possible. This tape was labelled 'R'

c) Speed Tape.

The function of this tape was to enable an examination of the importance of speed in the successful categorization of each of the 80 tunes to be made. The component to be modified was, therefore, speed. Clearly, the procedure to be adopted had to be slightly different from procedures in a) and b) above, since speed cannot be removed; otherwise music, being sound in time, would cease to exist. Further, there are two possible modifications with regard to speed; tunes could become either faster or slower than the originals. The researcher attempted to bring some precision into the modifications

to be done, by considering the Maelzel's Metronome indications (hereinafter referred to as 'MM'). It was hoped to draw up a number of 'bands' of speeds into which the original MM speeds would fall, rather after the method of drawing up a frequency distribution, and then specify that when any speeds fell into a particular band, they would all be played at a certain arbitrarily-fixed altered speed. This was shown to be unacceptable, as some original speeds were little altered in relation to others. Therefore it was decided to make an arbitrary judgment on each original speed; if it was felt to be slow, it was played at what was considered a fast speed and if it was felt to be fast, it was played at what was felt to be a slow speed. Where tunes contained more than one speed, the modified speed was different from each.

As with the previous two tapes, care was taken to allow, as far as possible, all other musical features to remain. This modified tape was labelled 'S'.

3. <u>The Ambiguity Tapes</u>.

The function of this part of the enquiry was to make an examination of children's preferences in one aspect of the original melodies. The aspect chosen was ambiguity/unambiguity.

From the 300 melodies composed, it was decided to select ten of each mood. Half the group would have been categorized as of only one mood, while the other half would have been categorized not only as being of the mood intended by the composer, but also as being of at least one other mood. The frequency of categorization of all tunes had to be at least at the 5% level of significance. To exemplify: in the group of ten 'Angry' tunes to be chosen, five would have been categorized as definitely and only 'angry', but the other five would have been categorized as not only 'angry' but also as perhaps 'Frightened'. Since this procedure provided too many tunes in some instances, it was decided that an acceptable criterion to reduce the possible tunes to ten was to take those tunes which had the greatest frequency of categorization.

When each mood group's ten tunes had been ascertained, each ambiguous tune within a group was paired with every unambiguous tune. This provided within each mood group, 25 pairs of tunes; over the five mood groups there were thus 125 paired melodies. These 125 pairs were recorded on magnetic tape, care being taken to randomize not only the order in which moods were arranged, but also so that sometimes unambiguous tunes were heard first in the pair and at other times the reverse. It was deemed advisable to produce three tapes with approximately one third of the total pairs on each, so that, one tape being used at a time, pupils were not subjected to what could

have been a too long listening session; had all 125 pairs been played to the listeners at one sitting, the fullest possible co-operation of the children could have been in doubt.

Response sheets of a uniform pattern were produced, so designed that for each pair of melodies, each child was required only to circle either the tune numbered first or the tune numbered second. Reference by the researcher to an answer sheet gave information as regards correctness or otherwise of the ringed number.

4. The Sample.

a) The School Background.

The school used for the research is situated in a coastal town in East Sussex. The pupils represent a social cross-section of society, coming as they do from a mixture of owner-occupier homes and council estate dwellings in approximately equal proportions. Many of the pupils are from unsatisfactory home backgrounds in respect of broken marriages or one-parent family circumstances. Over 60% of pupils are in receipt of free meals and this gives some indication of the financial situation in the locality. Conditions within the school are excellent, the building itself having been erected only 25 years ago at a time when money for education was lavishly being used where new provision was being made. The school has a well-established Brass Band; there are Recorder Ensembles,

containing Sopranino, Descant, Treble, Tenor and Bass voices as required. Guitar, violin, 'cello and orchestral percussion are taught; there is good provision of visiting music staff. However, since the number of pupils on roll is 670 and there is a limited amount of music staff available, only about 100 pupils come within the ambit of the provision quoted, it can hardly be said that such music is part of the life of the pupils ..... at least, as far as personal, practical participation is concerned. Of course a great deal of listening is afforded. Those not included above rely upon the services of an extremely competent teacher who deals with mainly choral class singing although the approach to this is enlightened and a musician ly one. During this class work, much use if made of a goodly array of percussion both untuned and tuned.

b) Tune Composers.

In the earlier experiment (LEGGATT 1974) it had been found that the most successful communication took place when tunes were composed by 2nd. Year junior pupils, so it seemed sensible therefore, to select such juniors to compose the tunes to be used in this research.

The pupils in the school chosen to assist, are in mixed ability classes; all classes contain boys and girls. The children's register numbers were noted and from these a random selection was taken. This provided 30 boys and 30 girls.

c) Tune Listeners.

Again, these were pupils in mixed ability classes. No selection of pupils from classes was made; the researcher used all who were present on the days chosen for taking their responses. Classes of 2nd., 3rd. and 4th. Year junior pupils, boys and girls, were used.

5. Extra-musical Factors.

The hypotheses adopted in their revised form indicate that the researcher wished to look for the possible interactions between, on the one hand the ability of the sample to recognize the musical cues that led to the successful categorizations of the tunes and what those cues were, and on the other hand the correlations, be they positive or negative, with some psychological factors in the subjects forming the sample used. In particular, two questions were to be examined:

> Is it demonstrable that the subjects who categorize successfully, both generators and auditors,
>
> i. have some particular personality traits?
>
> ii. have a specific ability to filter-out the musical ingredients which may be found to be part of the specification for a particular mood?

After a consideration of some of the personality factors outlined in Chapter Two it was decided that it would be feasible to administer the Junior Eysenck Personality

Inventory. This was to be given to all the pupils in the sample. It was further decided to obtain information concerning personality by asking the class teachers of the subjects to complete a questionnaire about each of the subjects in the sample. The instrument to be used would be the 'Bristol Social Adjustment Guide', devised by STOTT (1976). It was hoped that the evidence accruing from this would be useful for the investigator to draw up brief profiles about a small number of subjects whose performance seemed in any way noteworthy. It was further decided, in respect of 5(ii) above, to give a test to all subjects which might throw some light on their skill at differentiating figure from ground. It seemed reasonable to suppose that if there are particular components to tunes which can be, in whatever way, recognized by listeners as cueing them to categorize a tune specifically, the listeners must have some skill which may be observable; and if that skill is of the figure-ground variety, it may be possible to demonstrate this to be so. From the material available, it was decided to administer to the groups of generators and listeners, the first band, entitled 'Melody' of a set of music tests devised by DAVIES (1971), to which fuller reference was made in the second chapter.

II. The Experiments.

1. Introduction.

As already outlined, the materials to put the experiments in motion had been decided on and made. They comprised:

a) A Master Tape: This consisted of a cassette-type magnetic tape on which was recorded 80 tunes, equally representative of the five moods Angry, Comical, Dreamy, Frightened and Sad.

b) Modified Tapes:
   i. No rhythmic content.
   ii. No pitch content.
   iii. Each tune with varied speed.

c) Ambiguity Tapes.

d) A Personality Test.

e) A personality questionnaire.

f) An Embedded Figures Test.

2. The Experimental Process:

All the pupils in two mixed ability classes of each of 2nd., 3rd. and 4th. Year children, i.e. six classes in all, were used. In order to minimize possible stress to the pupils which might have been caused by the researcher working directly with the pupils, it was thought advisable for each class teacher to administer the listening tests to his own pupils. To avoid as far as possible any discrepancies in the details of the administr-

ation of the tests, each teacher was issued with a copy of uniform instructions for the giving of the tests. Explanations concerning the content of the tape were made. Pupils were instructed how to record their responses on the uniformly designed answer sheets. Explanation was made concerning how to alter responses in an unambiguous way to allow for 'second thoughts'. Short practices were made.

The same cassette player was used throughout, and the controls for tone and volume were set and sealed so that all pupils heard the tapes under identical conditions of reproduction. Further, all listening was undertaken between 11.00 am. and 3.00 pm. as a small scale enquiry (LEGGATT, 1970) had suggested these to be the times between which junior pupils tended to be most alert. It was also arranged that no pupils should be required to take part in this research at times which meant missing well-loved activities such as art, craft, swimming or games, as it was felt that otherwise some resistance to full and thoughtful participation might be aroused.

The sample responded to the three modified tapes with two days'interval between each audition. This was judged to be sufficiently long to enable memory of what had previously been heard to fade. In any case, it was considered highly unlikely that a child could remember for several hours what response, chosen from five, he

might have made to any one of 80 tunes. After several weeks, the same sample of pupils heard the original tape in its unmodified form.

Each pupil was also played the tape of embedded tunes under the same conditions that pertained to the previous four tapes. The Ambiguity tapes, however, were used only with 2nd. and 4th. Year pupils. Each pupil was further required to respond to the tape of embedded tunes and to complete the Junior Eysenck Personality Inventory already referred to. For this test each child had a prepared answer sheet. Again, it was thought to be less stressful if each child's own class teacher administered this test. That concluded the part actively played by the children.

CHAPTER FIVE

Collation and Processing of Results.

1. The Categorizations.

As remarked elsewhere, MOLES (1968) has referred to the method in empirical research within an aesthetic context of holding certain variables constant and this strategy is in general terms of interest to the present research. Further, in order to secure the most valid form of matching amongst the subjects used in the experiment, it was decided to use each subject as his own control. The following procedure was adopted:

1. All 80 tunes were categorized by mood, in the version as produced by the child composers who, as previously remarked, had shown themselves skilled in tune composition. The categorizations were made by 183 pupils.

2. The same 183 pupils now listened to the original tunes again, but in each of the three modified versions.

3. The three variables of pitch, rhythm and speed were manipulated in each of the three modifications; in the first two by removing them in turn and in the third by varying the

speed of tunes. When pitch was removed therefore, rhythm and speed were held constant according to the composer's original; when rhythm was removed the same pitch and speed as in the original were retained and when speed varied, pitch and rhythm were as defined by the composer in the original version of the tune.

The effect of this procedure was to produce mood categorization on the modified tunes which could be related to the original categorization of the unmodified tunes. For future reference, the following abbreviations will be used:

" O "; the tunes as originally composed,

"MOD1"; tunes modified by maintaining original pitch and speed, removing rhythm.

"MOD2"; tunes modified by maintaining original rhythm and speed, removing pitch.

"MOD3"; tunes modified by maintaining original rhythm and pitch, varying speeds.

The responses to the original and to the modified tunes were characterized by the letters A, C, D, F or S, these letters standing for the moods of the tunes as perceived by each child. Each letter represented the mood of which it was the initial letter, i.e. ANGRY, COMICAL, DREAMY, FRIGHTENED and SAD.

The information was suitably coded for processing by computer. Although there were originally 183 subjects, data for only 179 were usable on account of some information being incomplete. The processing took the form of cross-tabulations each of the following pattern:

TABLE 1

For Tune No. 46.

		Modified						
		1	2	3	4	5	Total	%
Original	1	11	21	8	16	4	60	33.5
	2	5	20	5	5	4	39	21.8
	3	6	4	2	0	0	12	6.7
	4	11	14	4	10	6	45	25.1
	5	4	10	2	4	3	23	12.8
Total		37	69	21	35	17	179	
	%	20.7	38.5	11.7	19.6	9.5		100

The vertical left-hand column 1 - 5 indicates the original mood and the horizontal top row similarly numbered indicates the listeners' perception of mood; 1 = angry, 2 = comical, 3 = dreamy, 4 = frightened and 5 = sad after modification. With reference to the example above for tune no. 46, the row totals show the number of subjects that categorized the original tune as A, C, D, F and S (these

are the initial letters of the moods). The frequencies are 60, 39, 12, 45 and 23 respectively. Similarly the column totals show how the subjects categorized the modified tune. The body of the Table gives the frequencies for the intersection of the two classifications. For example, of those 60 subjects who categorized the original tune as angry, on modification 11 categorized it as angry again, 21 as comical, 8 as dreamy, 16 as frightened and 4 as sad. The frequencies lying on the diagonal of the array, as marked, indicate the number of subjects remaining in the same category after modification. In contrast, the off-diagonal frequencies show the number of subjects who have changed classification. It was thus possible to construct for each cross-tabulation, Table 2 of the following pattern:

TABLE 2

	Same		Different		Total	%
Angry	11	(18.3%)	49	(81.7%)	60	100
Comical	20	(51.3%)	19	(48.7%)	39	100
Dreamy	2	(16.7%)	10	(83.3%)	12	100
Frightened	10	(22.2%)	35	(77.8%)	45	100
Sad	3	(13.0%)	20	(87.0%)	23	100
	46	(25.7%)	133	(74.3%)	179	100

Chi-squared = 17.8 (4 df.) Significance = $p < 0.01$

A significant chi-squared value indicates that the percentage of subjects remaining in the same mood category (A, C, D, F and S) on modification is different from the original categories. For example, the percentages 18.3, 51.3, 16.7, 22.2 and 13.0 for A, C, D, F and S respectively are significantly different and the differences are not due to chance. It must be noted that this is an over-all chi-square test indicating whether there are differences between percentages as a set.

For each Table like Table 2, a chi-squared value with four degrees of freedom was worked and in the example significance below the one per cent level was achieved. From these data, it was now possible to draw up three summary Tables for all 80 tunes. These would permit comparisons over all tunes and the facility to examine the differences in the probability of a tune's remaining in the same mood category and the probability of the tune's mood changing after modification. (Because of the difficulties involved in presentation, the 240 tables are not included in this account).

TABLE 3.1

MOD1	Same		Different	
Tune	Frequency	Percentage	Frequency	Percentage
1	70	39.10	109	60.90
2	57	31.84	122	68.16
3	92	51.39	87	48.61
4	61	34.07	118	65.93

etc .....

TABLE 3.2

MOD2	Same		Different	
Tune	Frequency	Percentage	Frequency	Percentage
1	46	25.69	133	74.31
2	56	31.28	123	68.72
3	34	18.99	145	81.01
4	37	20.67	142	79.33

etc .....

TABLE 3.3

MOD3	Same		Different	
Tune	Frequency	Percentage	Frequency	Percentage
1	66	36.87	113	63.13
2	54	30.16	125	69.84
3	38	21.22	141	78.78
4	54	30.16	125	69.84

etc .....

Further analysis of the information in Tables 3 was undertaken to examine discernible patterns of change effected by the three modifications and whether such patterns showed consistency over the 80 tunes.

In order to be able to make observations relating to the changes to tune mood perceptions consequent upon the modifications, a Table was made using the evidence collected from Table 2. In the example already cited as Table 2, it is apparent that "comical" mood was more resistant to change than all the other moods, so a preliminary statement viz. C A,D,F,S could be made. However, it became evident that sometimes there were more than two identities of comparison available. To meet this eventuality, a chi-squared test was carried out for each table so that partitioning might show homogeneous clusters of moods significantly different from each other in degree of resistance to change. Thus .....

Partitioning: See MAXWELL (1971).

for the third modification of tune no. 49 in Table 15.3 in the Appendix, it was found that the first cluster of A,C,F and D,S was amenable to partitioning which revealed significantly C A,F. Therefore an amended first statement now appeared as C A,F D,S. Sometimes, an overall chi-squared value for the five moods suggested that the proportions between moods were not statistically different from one another and partitioning would not lead to significant chi-squared values; in such a case, a simple statement of "No pattern" had to suffice. The complete account of these data appear in the Appendix but an extract is given:

TABLE 5

Tendency to change is from left to right

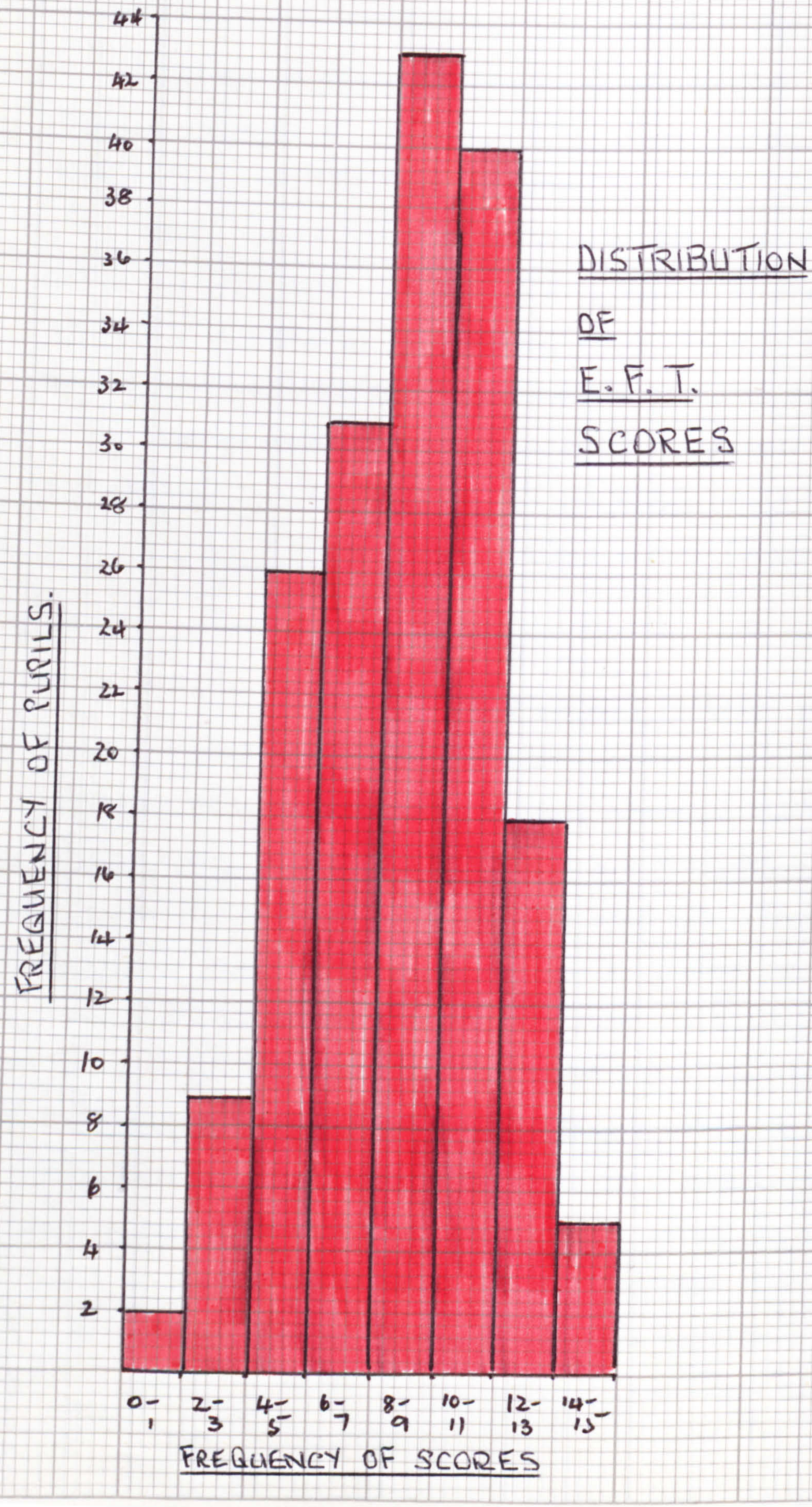
Tune no.	MOD1	MOD2	MOD3
33	CDFS A	CDFS A	CDS F A
34	AF DS C	No pattern	DS F AC
35	AF DS C	No pattern	AS DF C

The MOD1 statement in Table 5 which concerns tune no. 35 viz. AF DS C is to be interpreted thus: the "comical" mood category has the highest resistance to change as the result of the highest probability of being re-classified on modification as "comical". This mood has a greater

resistance to change than all the others. The moods "angry" and "frightened", and "dreamy" and "sad" have a similar rate of change within their own cluster, in probabilistic terms. The resistance to change of cluster DS is less than that shown by "comical" but greater than that demonstrated by cluster AF which is the least resistant to change of all, and this mood cluster has the highest probability of change. It is noteworthy that the clusters of moods designated AF and DS do experience some slight variations in rate of change within themselves but in fact these rates are not statistically different so are not recorded in the general statement.

2. <u>The Embedded Figures Test</u>.

The design of this test required each child to state whether or not a specially composed melodic fragment was perceivable within a longer melodic statement. The data obtained from this test were a simple frequency count. A maximum score of 15 could be achieved by any child who gave all correct answers to the test; such answers being "yes" to some questions but "no" to others required translating to "correct" or "incorrect" for the requirements of computer processing. The higher the number of "correct" responses, the more efficient was the subject at disembedding the fragment or indeed, in some cases realizing that the fragment was not included in the melodic statement.


DISTRIBUTION
OF
E. F. T.
SCORES
FREQUENCY OF PUPILS.
44
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0-1
2-3
4-5
6-7
8-9
10-11
12-13
14-15
FREQUENCY OF SCORES

When suitably analysed the data could provide information thus:

a. The distribution of the EFT scores, the overall mean and standard deviation.
b. The effect of age, sex and personality on EFT.
c. Comparison of composers and listeners with respect to EFT scores.
d. Correlation of change in categorization with EFT.

The following were the data obtained for each of the above:

a. Distribution of EFT scores.

TABLE 6

Frequency of correct responses (score)	Frequency of children scoring correctly	%age
1	2	1.1
2	3	1.7
3	6	3.4
4	5	2.8
5	21	11.7
6	13	7.3
7	18	10.1
8	17	9.5
9	26	14.5
10	21	11.7
11	19	10.6
12	14	7.8
13	4	2.2
14	4	2.2
15	1	1.0
Missing	5	2.8
	179	100.0 approx.

Mean = 8.02
S.D. = 2.99

b (i) <u>The Effect of sex on EFT</u>.

In order to check for differences between sex groups with regard to disembedding ability, and to include an examination of this within the separate groups of composers and listeners suitable data were extracted from the computer-held information thus:

TABLE 7

		Mean	S.D.	n	
Composers	BOYS	8.31	2.50	13	(1)
	GIRLS	8.50	2.48	16	(2)
Listeners	BOYS	8.01	2.89	78	(3)
	GIRLS	8.44	2.96	96	(4)

Composers: Boys v Girls: $t_{12} = 0.098$ ns
Listeners: Boys v Girls: $t_{34} = 0.004$ ns

BOYS: Composers v Listeners: $t_{13} = 0.002$ ns
GIRLS: Composers v Listeners: $t_{24} = 0.0003$ ns

b (ii) The Effect of Age on EFT.

TABLE 8

	Age	Mean	S.D.	n
BOYS	8+	7.52	3.26	27
	9+	8.27	3.10	22
	10+	8.27	2.34	29
GIRLS	8+	7.55	2.65	38
	9+	8.95	3.06	22
	10+	9.06	3.05	36

Analysis of Variance Table

Source of Variation	Sum of squares	d.f.	Mean square	F-ratio	*Sig. level
Sex	9.87	1	9.87	1.17	0.28 (ns)
Age	54.45	2	27.22	3.23	0.04 (s)
Sex x age interaction	5.03	2	2.51	0.30	0.99 (ns)
Residual	1415.14	168	8.42		
Total	1482.37	173			

The Analysis of Variance Table enables tests of significance for the effects of sex and age, as well as the interaction between them, to be carried out.

*This column is the actual probability of observing the F-ratio given.

b (iii) <u>The Relationship between Personality and EFT</u>.

<u>TABLE 9</u>

	Pearson "r"	*Signif. level	
EFT x Extraversion	+0.11	0.15	ns
EFT x Neuroticism	-0.07	0.38	ns
Eft x Lie	-0.16	0.04	s

The Table enables any relationship between EFT scores and the three factors of personality tested to be examined.

c. <u>EFT and the Modifications.</u>

After a tune had been modified, if pupils were able to categorize it as the same mood as before modification, it could be that the children had perceived like components in both versions, the components being sufficient to cue identical responses. This might imply a facility by such children in recognizing salient features common to both versions. It was decided to see if the children who categorized in this way could be identified by their parallel ability at disembedding. The expectation would be that a high score at disembedding would correlate positively with high frequency of tunes categorized by the same mood description as between original and

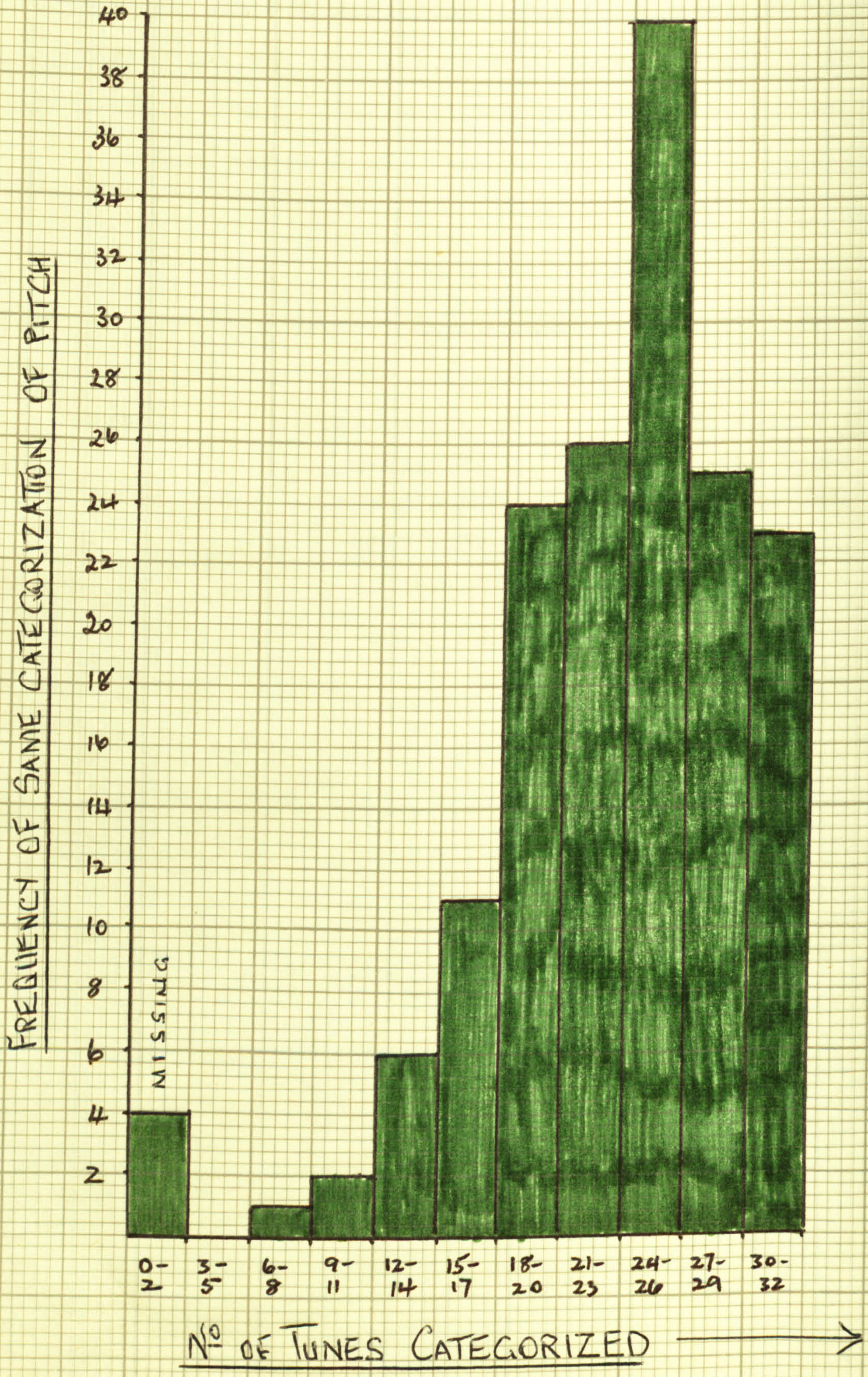
*This column is the actual probability of observing the F-ratio given.

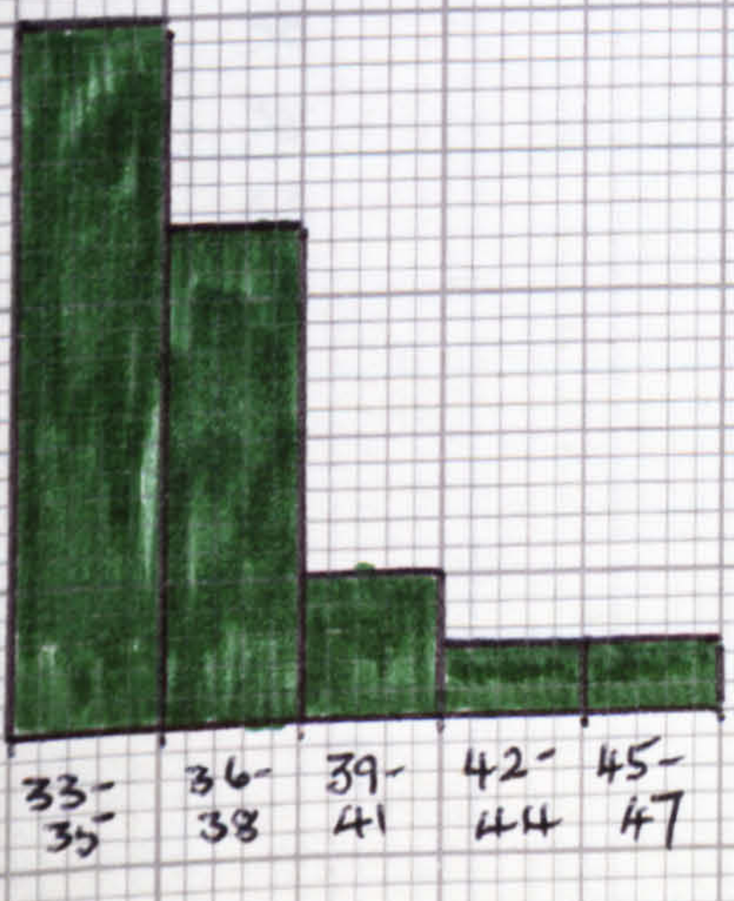
a modification. The following tables give the information for each modification. In the Tables, column 1 gives the number of tunes which after modification were categorized as being the same mood as when the tune was heard in the original version without modification. Column 2 gives the frequency of listeners who made the decision just described.

TABLE 10.1

MOD1 Number of tunes categ'd same as orig.	Frequency of listeners judging as same mood	%age
7	1	0.5
9	1	0.5
11	1	0.5
13	3	1.7
14	3	1.7
15	2	1.1
16	6	3.4
17	3	1.7

(table concl'd over)


FREQUENCY OF SAME CATEGORIZATION OF PITCH
MISSING
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0-2
3-5
6-8
9-11
12-14
15-17
18-20
21-23
24-26
27-29
30-32
No OF TUNES CATEGORIZED



← CONTINUATION OF SCALE

TABLE 10.1 (concl'd)

MOD1	Number of tunes categ'd same as orig.	Frequency of listeners judging as same mood.	%age
18		6	3.4
19		10	5.6
20		8	4.5
21		10	5.6
22		8	4.5
23		8	4.5
24		14	7.8
25		15	8.3
26		11	6.1
27		11	6.1
28		8	4.5
29		6	3.4
30		11	6.1
31		9	5.0
32		3	1.7
33		2	1.1
34		4	2.2
35		4	2.2
36		2	1.1
37		2	1.1
38		3	1.7
39		2	1.1
43		1	0.5
46		1	0.5
		179	100.0 approx.

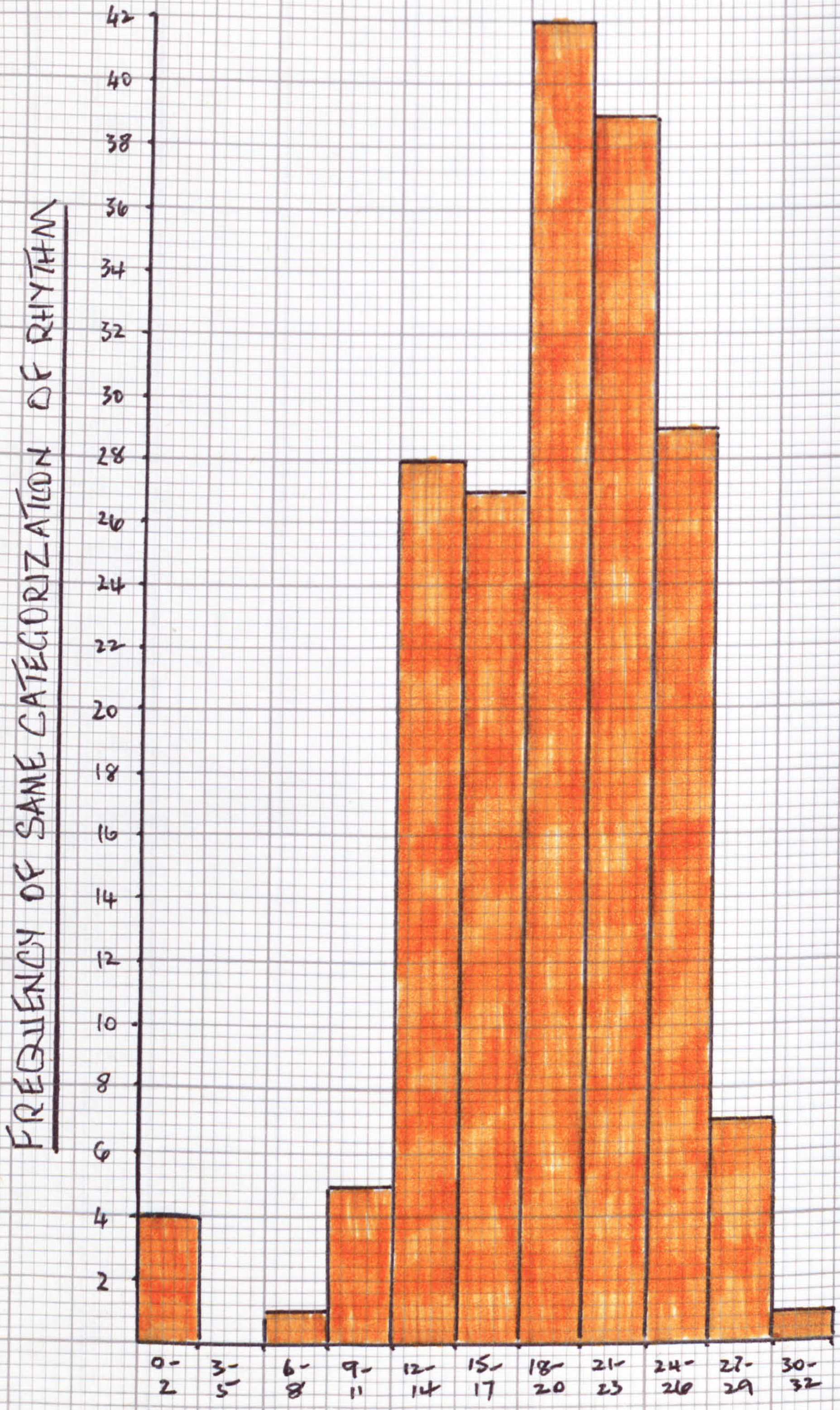

FREQUENCY OF SAME CATEGORIZATION OF RHYTHM
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0-2
3-5
6-8
9-11
12-14
15-17
18-20
21-23
24-26
27-29
30-32
Nº OF TUNES CATEGORIZED

TABLE 10.2

MOD2 Number of tunes categ'd same as orig.	Frequency of listeners judging as same mood.	%age
8	1	0.5
9	1	0.5
11	4	2.2
12	5	2.8
13	10	5.6
14	13	7.3
15	6	3.4
16	11	6.1
17	10	5.6
18	20	11.2
19	14	7.8
20	8	4.5
21	15	8.3
22	12	6.7
23	12	6.7
24	10	5.6
25	8	4.5
26	11	6.1
27	3	1.7
28	3	1.7
29	1	0.5
31	1	0.5
	179	100.0 approx.

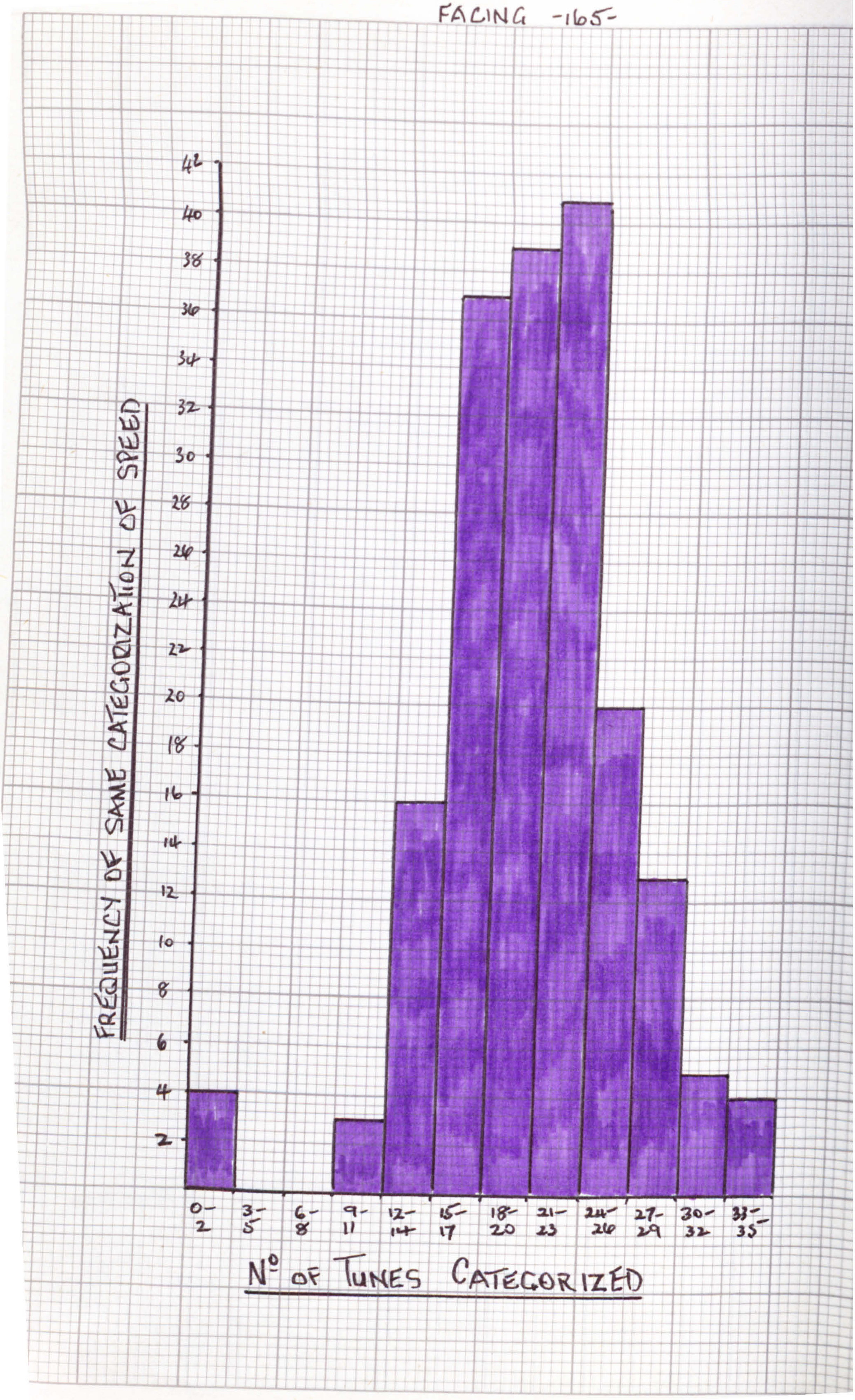

FREQUENCY OF SAME CATEGORIZATION OF SPEED
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0-2
3-5
6-8
9-11
12-14
15-17
18-20
21-23
24-26
27-29
30-32
33-35
Nº OF TUNES CATEGORIZED

TABLE 10.3

MOD3 Number of tunes categ'd same as orig.	Frequency of listeners judging as same mood	%age
11	3	1.6
12	3	1.6
13	3	1.6
14	10	5.6
15	10	5.6
16	13	7.3
17	14	7.8
18	13	7.3
19	13	7.3
20	13	7.3
21	12	6.7
22	20	11.2
23	9	5.0
24	8	4.5
25	7	3.9
26	5	2.8
27	5	2.8
28	3	1.6
29	5	2.8
30	1	0.5
31	2	1.1
32	2	1.1
33	4	2.2
34	1	0.5
	179	100.0 approx.

Tables 10.1, 10.2 and 10.3 above show the frequency of no change in categorization as between each tune's originally perceived categorization and the categorization perceived after modification of that tune. For example, in Table 10.3 the second entry indicates that three listeners chose the same categorization for 11 tunes i.e. they changed their decision on 69 tunes, whilst at the other extreme, one listener perceived that 34 tunes were of the same categorization after modification as their perception of the originals before modification. A similar explanation applies to Tables 10.1 and 10.2.

The computer was programmed to produce correlations between the frequency of tunes categorized as the same after each modification and the EFT score frequencies. These are given in the following:

TABLE 11.

Pearson Correlation Coefficients.

	r	Signif. level	
MOD1	+0.1713	0.01	s
MOD2	+0.1309	0.04	s
MOD3	+0.1177	0.06	ns

3. <u>The Personality Test</u>.

The expectation is that since music is emotionally based in the intellectual process, there may be a link between the perception of the mood of tunes and the perceiver's personality. To test this theory with young children, each child in both composer and listener groups was given the Junior Eysenck Personality Inventory. The 60 responses when suitably coded were processed by computer. The data produced information regarding extraversion and neuroticism, and the lie scale incorporated in the battery would help decisions to be made regarding the veracity of the responses. The data were necessary in order to be able to make observations later concerning the correlation of personality with performance in the categorization of moods; e.g. any marked degree of heterogeneity between composers and listeners or between sexes, or between age groups, could have an important bearing on the interpretation of any findings that might accrue. A summary of the data follows:

TABLE 12

Personality of Composers.

Only pupils age 8+

Extraversion

	Mean	S.D.	n	F	Signif.
BOYS	18.75	3.51	20	0.56	ns
GIRLS	17.67	5.32	18		

Neuroticism

	Mean	S.D.	n	F	Signif.
BOYS	13.65	4.12	20	1.56	ns
GIRLS	15.39	4.47	18		

Lie

	Mean	S.D.	n	F	Signif.
BOYS	1.80	1.44	20	0.03	ns
GIRLS	1.72	1.23	18		

TABLE 13.1

Personality of Listeners.

Extraversion

BOYS	Age group	Mean	S.D.	n
	1	17.79	3.24	29
	2	17.13	4.49	23
	3	17.14	3.22	29
GIRLS	1	17.21	3.43	38
	2	18.25	3.30	24
	3	18.75	3.93	36

Analysis of Variance Table

Source of Variation	Sum of Squares	d.f.	Mean square	F-ratio	*Sig. level
Sex	18.00	1	18.00	1.35	0.24 (ns)
Age	10.82	2	5.41	0.41	0.99 (ns)
Sex x age Interaction	43.33	2	21.66	1.62	0.20 (ns)
Residual	2240.56	168	13.34		
Total	2311.86	173			

* This is the actual probability of observing the F-ratio given

TABLE 13.2

Personality of Listeners

Neuroticism

	Age group	Mean	S.D.	n
BOYS	1	14.00	4.35	29
	2	14.43	4.67	23
	3	11.79	4.60	29
GIRLS	1	15.92	5.28	38
	2	16.38	4.21	24
	3	14.61	3.95	36

Analysis of Variance Table

Source of Variation	Sum of Squares	d.f.	Mean Square	F-ratio	*Sig. level
Sex	235.37	1	235.37	11.34	0.001 (s)
Age	142.07	2	71.04	3.42	0.03 (s)
Sex x Age Interaction	5.78	2	2.89	0.14	0.99 (ns)
Residual	3487.35	168	20.76		
Total	3865.49	173			

* This is the actual probability of observing the F-ratio given.

LIE PROFILES

AFTER TABLE 13.3

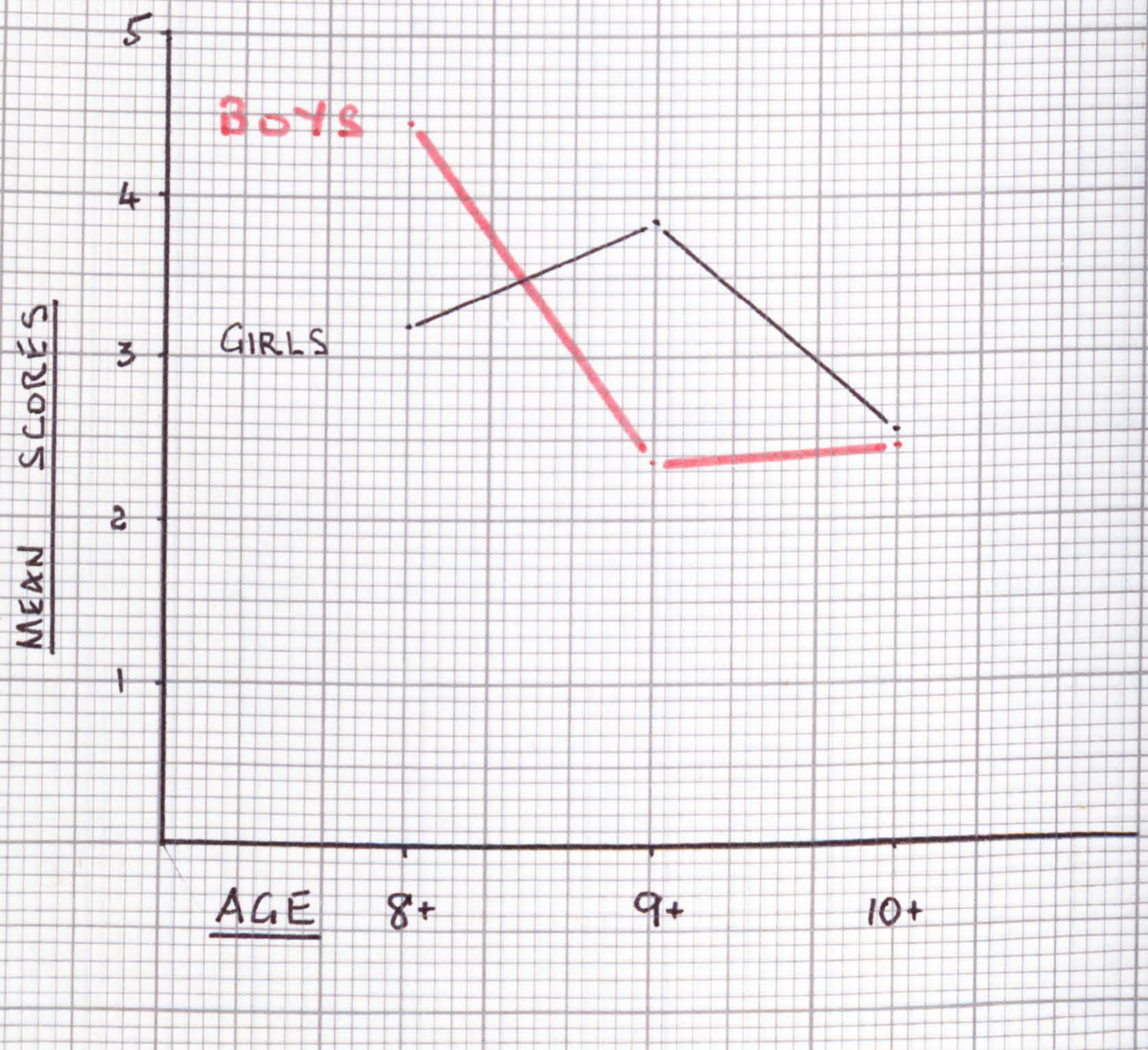


TABLE 13.3

Personality of Listeners.

Lie

	Age group	Mean	S.D.	n
BOYS	1	4.45	1.90	29
	2	2.35	2.06	23
	3	2.45	1.64	29
GIRLS	1	3.18	2.40	38
	2	3.88	2.77	24
	3	2.53	1.80	36

Analysis of Variance Table

Source of Variation	Sum of Squares	d.f.	Mean Square	F-ratio	*Sig. level
Sex	0.14	1	0.14	0.03	0.99 (ns)
Age	45.96	2	22.98	5.08	0.007 (s)
Sex x Age Interaction	42.63	2	21.31	4.71	0.01 (s)
Residual	759.70	168	4.52		
Total	848.31	173			

* This is the actual probability of observing the F-ratio given.

Extracting the relevant data from Tables 13, the following Table can be made:

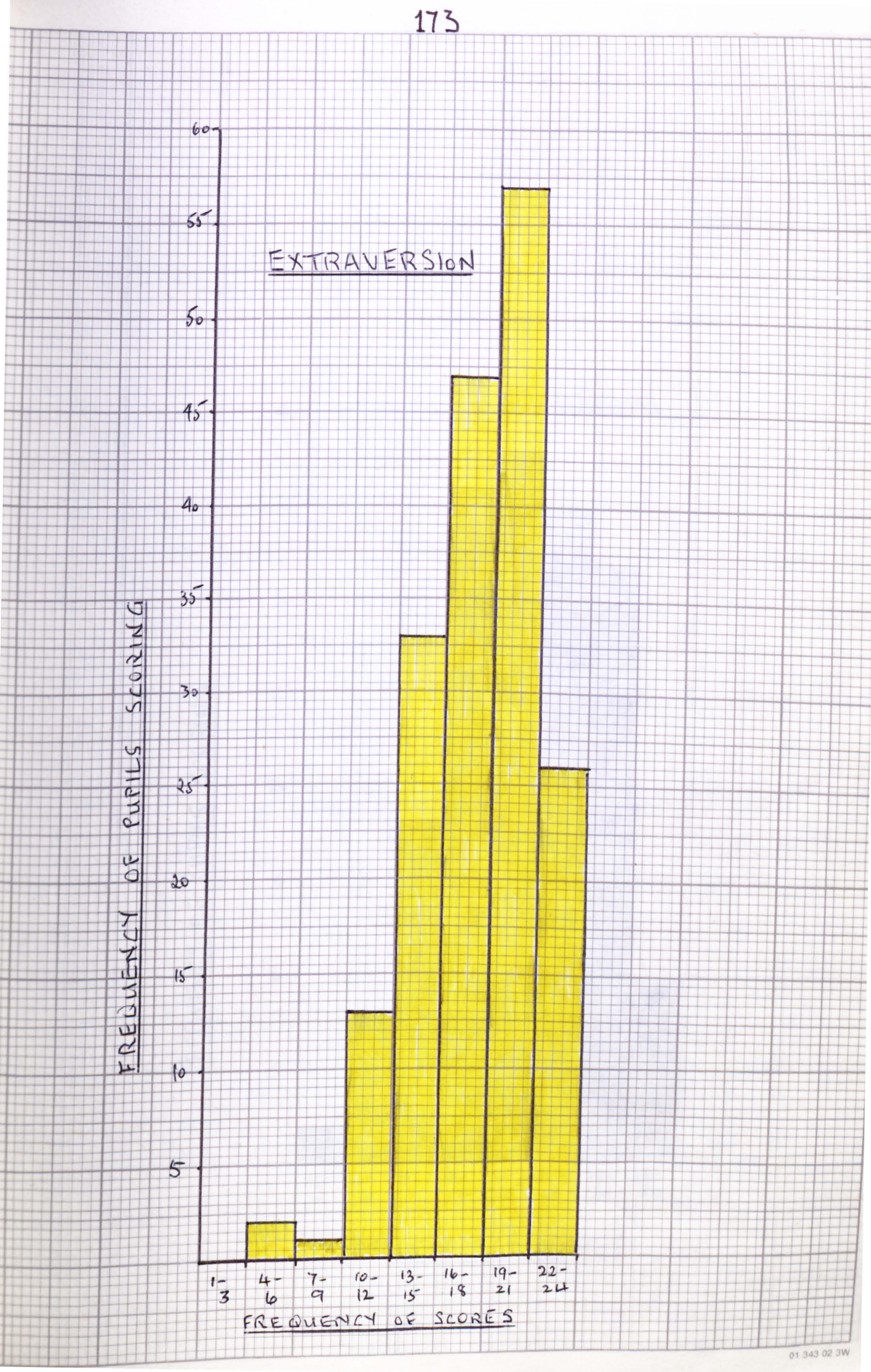
TABLE 14

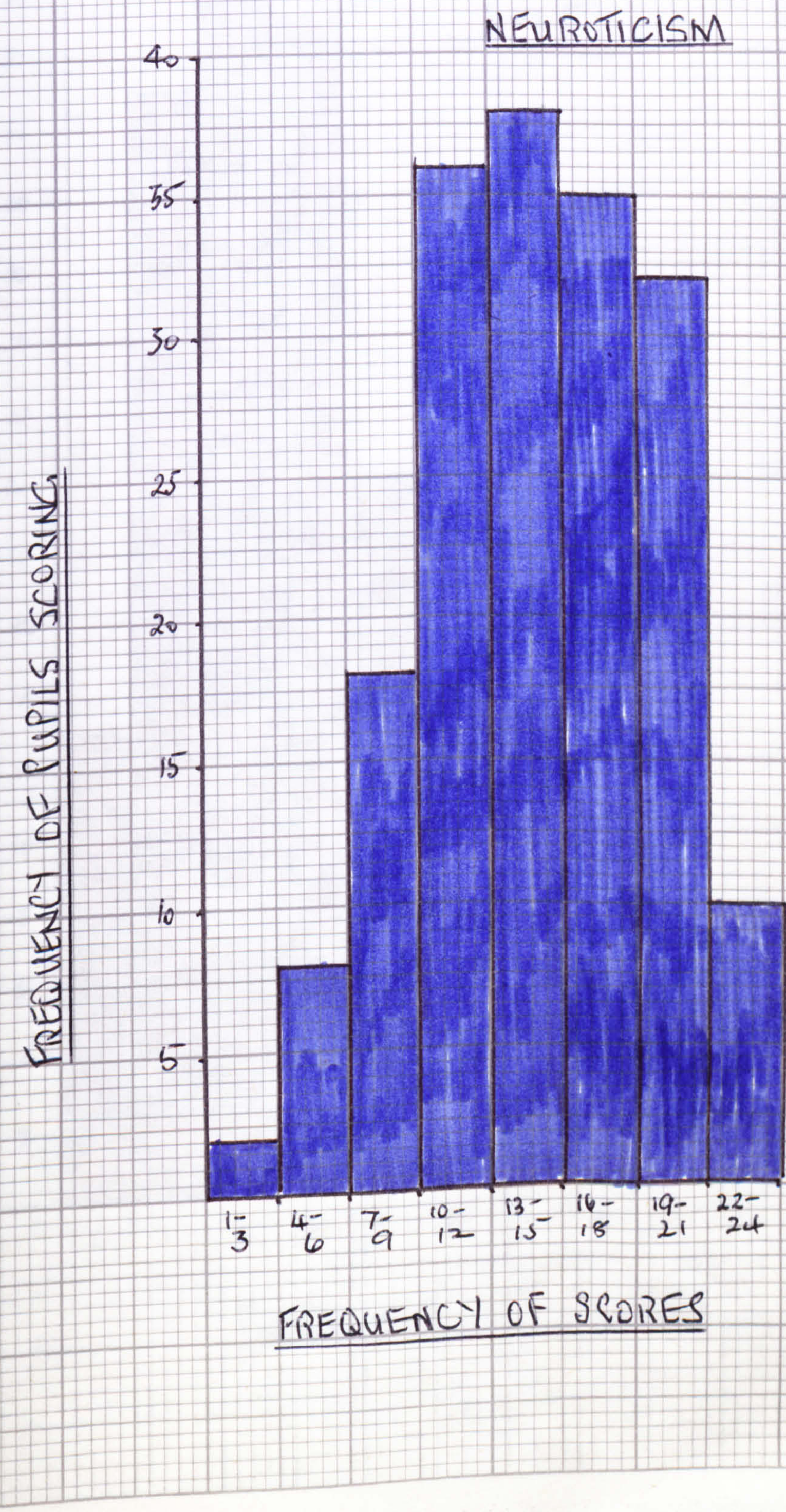
Personality; Composers v Listeners.

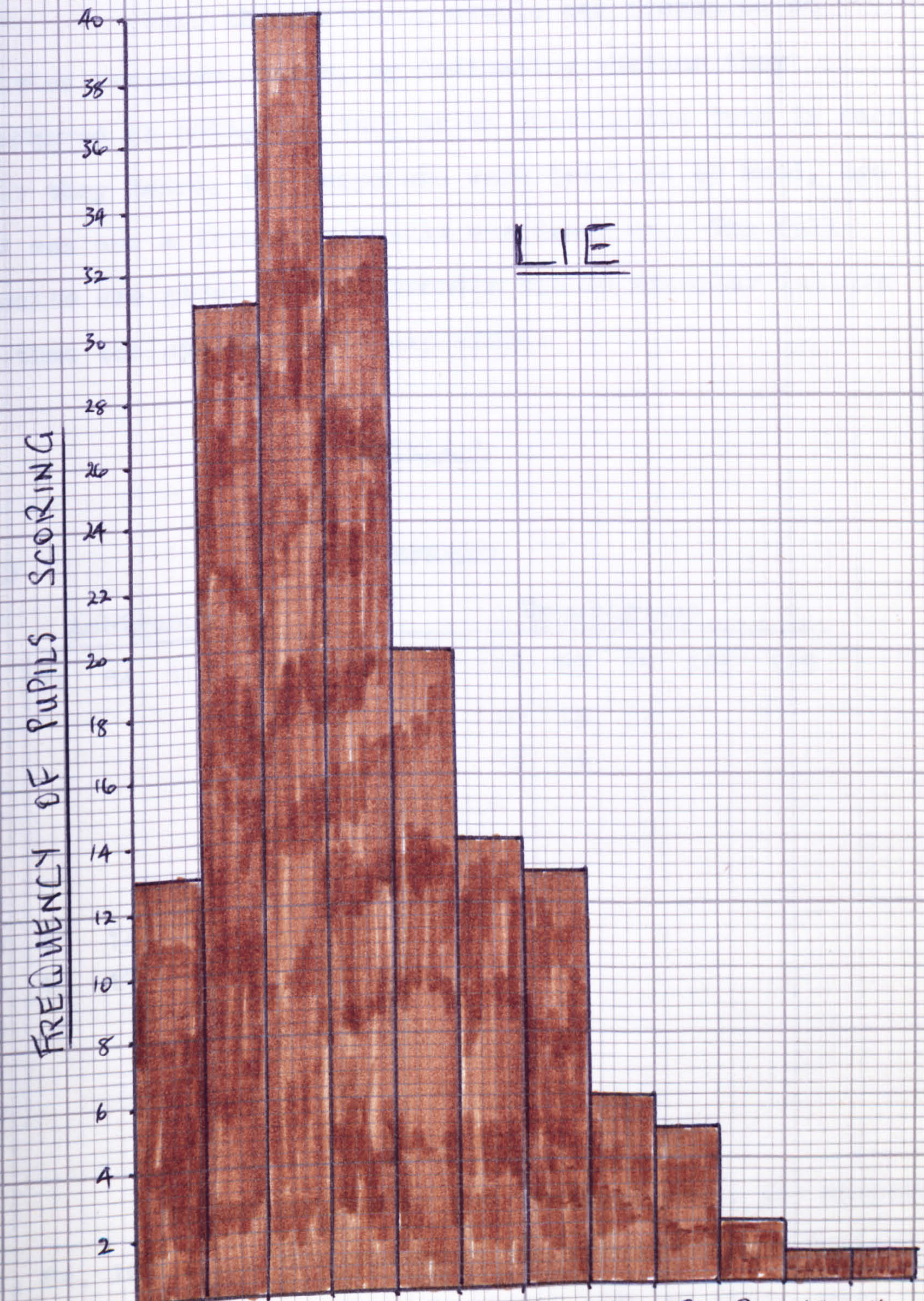
Age group 1 only.

	LISTENERS			COMPOSERS				
BOYS	Means	S.D.	n	Means	S.D.	n	t	Sig.
Ext.	17.79	3.24	29	18.75	3.51	20	0.007	ns
Neu.	14.00	4.35	29	13.65	4.12	20	0.003	ns
Lie	4.45	1.90	29	1.80	1.44	20	0.083	ns
GIRLS								
Ext.	17.21	3.43	38	17.67	5.32	18	0.003	ns
Neu.	15.92	5.28	38	15.39	4.47	18	0.208	ns
Lie	3.18	2.40	38	1.72	1.23	18	0.050	ns

The above Table provides a basis for a comparison to be made between Composers and Listeners with regard to those items of personality which were tested, viz. extraversion, neuroticism and lie.


EXTRAVERSION
FREQUENCY OF PUPILS SCORING
60
55
50
45
40
35
30
25
20
15
10
5
1-3
4-6
7-9
10-12
13-15
16-18
19-21
22-24
FREQUENCY OF SCORES


NEUROTICISM
40
35
30
25
20
15
10
5
FREQUENCY OF PUPILS SCORING
1-3
4-6
7-9
10-12
13-15
16-18
19-21
22-24
FREQUENCY OF SCORES



FREQUENCY OF SCORES

4.The Ambiguity Experiment

When the listening sample had responded on printed response sheets, by indicating whether they preferred an ambiguous tune or an unambiguous tune in each pair they heard, the responses were totalled by mood, age and sex and a frequency matrix was drawn up. The full results are given in the Appendix but an exemplar follows so that the system can be explained:

MATRIX 1

A2B — PREFERRED

	Ambiguous					Unambiguous				
	71	84	107	124	163	49	69	75	105	129
71						10	19	22		
84						13	14			
107										
124										
163										
49	17	14								
69	10	17								
75	5									
105										
129										

On the horizontal and vertical axes, the numbers 71, 84, 107 ..... 129 represent the identification numbers of each tune played. When the first pair of tunes, viz. nos. 71 and 49 was played, 10 judges said they preferred the unambiguous tune no. 49, but 17 judges declared in favour of no. 71. Similarly, of the pair of tunes nos. 71 and 69,

the unambiguous no. 69 was preferred to the ambiguous no. 71 by 19 judgments to 10; and similarly between tunes nos. 84 and 69, the ambiguous no. 84 was chosen against unambiguous no. 69.

Thus matrices could be drawn up for the five moods Angry, Comical, Dreamy, Frightened and Sad with respect to age and sex.

From these matrices, it was possible to draw up a simple display, using only "1" or "0" for each pair judged, whether ambiguity or unambiguity was preferred, at first using a straight forward majority as the basis for decision. The full tables of decisions are included in the Appendix, but for explanatory purposes a model follows:

MATRIX 2

A2B PREFERRED

	Ambiguous					Unambiguous				
	71	84	107	124	163	49	69	75	105	129
71						0	1	1		
84						0	0			
107										
124										
163										
49	1	1								
69	0	1								
75	0									
105										
129										

Tunes are identified, horizontally and vertically in a manner identical with the first matrix example, headed MATRIX 1. The method of recording the majority decision for ambiguity or unambiguity was to enter "0" in the co-ordinate intersection whose frequency was lower than the compared frequency, the latter being scored as "1". Thus in MATRIX 2, the figure "0" is entered under horizontal 49, because tune no. 49 was in the minority in MATRIX 1 as against horizontal 71, below which, and co-ordinate with vertical 49, is entered "1". Similarly, because ambiguous tune no. 84 is preferred to unambiguous tune no. 69, it is scored as "1" and co-ordinate vertical 69/horizontal 84; whilst "0" is entered at co-ordinate vertival 71/horizontal 69. If "tied" frequencies occurred, these were recorded as " = ".

However, in order to secure greater rigour for the decisions to be inferred from MATRIX 2, a further refinement was made. For example, in MATRIX 1, for each pair of tunes, it was decided to test the strength of the proportion of judgments in favour of the ambiguous tune of each pair, against the judgments in favour of the unambiguous tune in the same pair. For instance, with regard to the pair of tunes nos. 49 and 71 in MATRIX 1, was there sufficient difference between the poll of 10 in favour of unambiguous no. 49 and the poll of 17 in favour of ambiguous no 71 ?

To discover this for each pair, every pair of judgment frequencies was submitted to chi-square processing. It will be seen (see Appendix) that where a proportion was found acceptable by taking the 5% level of significance as the criterion, the relevant "1" was marked with a red spot. It was now a simple matter to find the total frequencies for preferred ambiguous or unambiguous tunes; these are given in the Appendix.

Summary tables, having been drawn up, enabled final conclusions to be drawn with respect to these groups:

Groups	Preference Frequencies
Within ambiguity/ unambiguity	Within age groups
	Between sex groups
Between ambiguity/ unambiguity	By whole group
	Within age groups
	Within sex groups
	Between moods.

CHAPTER SIX

Statement of Findings.

This chapter is based upon each of the sections in Chapter Five and follows an identical sequence.

1. The Categorizations.

(i) The contention is that when a tune as composed is modified in each of the three ways previously described, the categorization now given to each tune will change if the remaining two components are insufficient to cue the listener to make the original response again. If no change occurs, the remaining two components were sufficient of themselves to cue the listeners to give the original response again.

FINDING: From cross-tabulations (Chapter 5, type Table 1), it was found that when the tunes were modified by each of the three ways already described, every categorization demonstrated varying degrees of change within each modification.

(ii) It was decided to examine for the effect of age and sex on the mood classifications made by the listeners on the original tunes. This was worked by computer, but since only four results for sex effect and eight for age effect reached 5% significance out of 80 events examined in each group, it was decided that:

FINDING: Neither age nor sex differences can be demonstrated for classification of the original tunes.

By the age of 8+ children have the constructs --- whatever they are --- and they are comparable across age groups.

(iii) With reference to section 1 (i) above, however, not all changes were of sufficient amount to give confidence that the changes were substantial enough as a basis for firm conclusions. To clarify the situation a systematic examination of all the data (of the type in Table 2, Chapter 5) was made. Where the chi-squared value did not reach 5% significance level for a particular tune, it was not considered further. Where significance was reached however, as in the case given as Table 2 in the fifth chapter, inferences could be drawn regarding which mood or moods were most and least resistant to change. For example, in the Table 2 cited, it can be inferred that the "Comical" mood was the one most resistant to change, which could have been caused by the modification undergone by the original, since 51.3% is the largest proportion of the five. Inspection of Tables 3.1, 3.2 and 3.3 given in full in the Appendix, showed inconsistency of the mean percentage of changes of mood between modifications.

An "F" test between pairs of modifications was done and the data are recorded in Table 3.4 in the Appendix. Significance at the 5% level having been observed for all three "F" ratios, the implication is:

FINDING: The effect of different modifications of tunes is to bring about varying amount of change in the re-categorization of the original tune.

As regards the actual probabilities of change, Table 3.4 indicates that within modifications, the rates of change of categorization appeared to be broadly similar as the standard deviations are small. The odds of change to no change appear to be about 2 : 1 for MOD1 whilst in the other modifications the odds lengthen to 3 : 1 approximately. The probability of change is lower in MOD1 than in MOD2 and in MOD3. This suggests that the information carried by pitch and speed in MOD1, rhythm having been taken out, is more likely to enable listeners to categorize MOD1 moods more nearly like the original categorizations than in MOD2 where the information carried by rhythm and speed, pitch having been removed, is not sufficient to prevent greater change in MOD2 than in MOD1. Whilst these differences are not great but also taking into account that the S.D. for MOD2 is the smallest suggesting greater consensus, it may be a hint that:

FINDING: Rhythm and speed are less helpful in the categorization of tunes than are pitch and speed.

As regards MOD1 and MOD3, the implication is that because the probability of change is lower in MOD1 than in MOD3 where the speed was varied, listeners are more likely to categorize MOD1 more nearly like the original categorization than MOD3.

FINDING: The speed chosen by composers is an important factor in listeners' categorization of tunes.

In MOD2 and MOD3 the probability of change is approximately the same and this implies that neither the inclusion of rhythm in MOD3, speed being modified, nor the use of the original speed in MOD2, rhythm being absent, makes any measurable difference in supplying cues to categorization.

FINDING: No evidence is found to suggest that either one of rhythm and speed has a more discriminating effect in the categorization of tunes.

If regard is had to the last three findings above, it would appear that an alternative Finding (see III, Chapter 7, "Implications for further research") can be deduced:

FINDING: Cues to the categorization of tunes CAN be provided by the interaction of on the one hand pitch and speed, and on the other hand by pitch and rhythm. However, it is by no means certain that in some cases the interaction of pitch, rhythm and speed is necessary for categorization.

(iv) In Table 4 in the Appendix, a count of patterns in the decision column could show comparisons between modifications of their resistance to change. The summary given at the end of Table 4 shows that overall, MOD1 produced a somewhat higher resistance to change than the other two modifications. Of the 40 tunes where unequal resistance to change is observed, the slight emphasis in favour of MOD1 is significant at the 5% level. Such a resistance to change may imply, as already stated, that pitch and speed are sufficient cues for categorizations, although perhaps not in all cases. However, in all three modifications there is a higher probability of certain outcomes than of others, with respect to the movement in perception from one mood cluster to another. In the Appendix, Tables 15.1, 15.2 and 15.3 show the main mood clusters grouped by kind. It is clear from these groupings that:

FINDING:

MOD1: Original clusters tend to change to clusters A,F and C,D.

FINDING:

MOD2: Original clusters tend to change to cluster A,F.

MOD3: With respect to speed,

(i) When the original tune is played more quickly, change is to C;

(ii) When the original tune is played more slowly, change is to D,S.

With respect to cluster A,F there is change from A to F and F to A; there is also change FROM cluster A,F as well as change TO cluster A,F. With respect to (i) above, it is noticed that there is a tendency for all four moods Angry, Dreamy, Frightened and Sad to change to Comical with approximately equal likelihood, but if there is a cluster most likely to change to Comical it is D,S. With respect to (ii) above, the tendency is that moods A, C and F will cluster and offer about equal likelihood of changing to mood C.

The implication of these changes is that combinations of different components cause a tendency for original tunes to be categorized in specific ways. This argues for some type of specificity of effect which may be attributable to the components of the music. It is pertinent that different perceptions of mood result from the use of different components and the indication is that the components may have unique effects.

2. <u>The Embedded Figures Test</u>.

Examination of the data in Table 6 concerning the distribution of EFT scores shows them to be somewhat skew to the right about a mean of 8.02, and a standard deviation of 2.99.

Table 7 shows that, given this particular EFT, no difference in disembedding ability could be detected between the composers and the listeners. On the assumption that the test was valid, it would seem that disembedding is not a discriminating factor between the two groups. Alternatively, the composers and listeners groups might have attained the same level of disembedding skill.

<u>FINDING</u>: No difference in disembedding ability between the composers and the listeners could be demonstrated. This finding holds for each sex group separately.

It appears that age and sex are exerting their effect on the EFT scores independently, as the interaction between age and sex is not significant. Of the main effects only the age factor attains significance at the 5% level.

<u>FINDING</u>: Age affects the disembedding ability and there is a linear trend by age; as age increases, so does the EFT ability.

As regards the EFT and the three modifications Table 16 shows only those cases where a significant F ratio was obtained between listeners' agreement on particular moods and common ability of those listeners at the EFT.

With regard to the EFT and the actual categorizations after modification, there is an apparent contradiction between the evidence of Tables 17.1 and 17.2 compared with Tables 10.1, 10.2, 10.3 and 11. In the case of Tables 17, only 28 instances of a statistically significant relationship between ability on the EFT and consensus of categorization out of 320 cases available was found. However, Tables 10 and 11, based on these cases, show evidence of positive and significant correlation between the three modifications and the frequency of agreement between listeners on judgment of no change after modification of the original tune. The two positions may however be reconcilable when it is seen that the correlations are in fact extremely low; and indeed it could well be that the 28 instances referred to in Tables 17 are the cases which are accounted in the positive correlations in Table 11. It is safe only to conclude:

FINDING: Ability to disembed does not appear to be a factor in categorization of mood, since there is no evidence to suggest any different disembedding abilities between those pupils who agreed on the same mood classifications from those who disagreed.

This finding is important as it demonstrated similarity between pupils with regard to disembedding skills and suggests that they belong to a homogeneous population. The implication of this is that whatever the criteria employed by the children were in the formation of percepts relating to mood in music, the children shared a more or less equal ability at disembedding and therefore there can be no suspicion that any musical effects of the modifications were influenced by variation in disembedding skills.

3. The Personality Test.

The three factors of extraversion, neuroticism and lie were examined; the last was used as a check on the truth of statements made in the first two areas. The scores were correlated with the EFT scores (Table 9) using the Pearson Product-Moment Correlation Coefficient and worked by computer. Whilst neuroticism and lie correlated negatively with EFT, a positive correlation between extraversion and EFT was found; this however was very slight and not significant. The implication of this is that any differences that may exist in EFT ability between individuals used, cannot be attributed to personality variables within the limits of the test apparatus employed.

FINDING: No evidence could be found to support any claim that EFT ability and personality are related.

Examination of Tables 12, 13 and 14 relating to the personality of the children reveals the following:

FINDING: a. The Composers' sample.

There are no significant differences in extraversion, neuroticism or lie attributable to sex.

b. The Listeners' sample.

(i) Girls tend to a higher level of neuroticism than boys.

(ii) Both boys and girls are more neurotic in the oldest age group (10+) compared with the two younger groups.

(iii) There is a sex/age interaction in the Lie components of the Personality Test (see diagram). The youngest group of boys score more highly on the lie scale than the 9+ and 10+ groups. However, for girls, the 9+ group has a higher mean than the remaining groups. For the 8+ age group boys have significantly higher lie scores than girls, the positions being reversed for the 9+ age group. In the 10+ age group no differences can be found between boys and girls.

c. Composers and Listeners.

There are no significant differences between these groups with regard to the personality factors extraversion, neuroticism and lie.

The differences between age and sex groups regarding neuroticism and lie scales of the Listeners will not affect the findings regarding differences between composers and listeners, as it will be seen from Table 14 that the comparisons are made within sex groups and there is only one age group involved. Hence:

FINDING: The Composer and Listener groups can be considered to be comparable in their personality.

4. The Ambiguity Test.

1. Preferences between ambiguous and unambiguous in Comical and Frightened tunes are clear-cut in respect only of 4th. Year boys; they appear to prefer the unambiguous.

2. As regards Dreamy tunes, girls showed a decisive preference for unambiguous tunes across the age groups.

3. In the case of Angry tunes, only the younger boys did not reveal a decisive preference. All other pupils, regardless of sex, demonstrated a strong preference for ambiguity.

4. The clearest decisions of all were made in Sad tunes, where all pupils, irrespective of age or sex, clearly preferred ambiguous tunes.

FINDING: Preference for ambiguous tunes was demonstrated for Comical, Dreamy and Frightened tunes but no general statement can be made for this preference regarding sex and age groups. (See 1 and 2 above).

FINDING: It seems evident that some bias towards a preference for ambiguity is demonstrated for Angry and Sad tunes, and in general this preference appears to be true for all age and sex groups. (See 3 and 4 above).

It is quite obvious that whether ambiguous tunes are really preferred to unambiguous is a function of the mood.

CHAPTER SEVEN

I. Immediate Conclusions.

It is proposed to restate each hypothesis in turn and relate the findings to them. All statements should, of course, be taken as specific only within the constraints imposed by the research methods and instruments employed.

Hypothesis 1 (i). Junior children can communicate moods through original melodies by virtue of one or more essential, identifiable components.

(ii). This communication is made by virtue of one or more components.

Conclusion on 1 (i).

Although some type of communication passes between composer and listener, it is less likely that it would be the specific communication intended by the composer. This section of the hypothesis is thus rejected.

Conclusion on 1 (ii).

The modification of tunes produced change in categorization; there is some evidence that the type of modification influences the choice of categorization, depending on the components used, i.e. whether pitch and original speed,

rhythm and original speed or pitch, rhythm and altered speed. The link between the mode of a component and the type of mood suggests support for the second section of the first hypothesis.

The components considered were:

a. relative pitch,

b. rhythm and

c. speed.

Hypothesis 1 (ii) demonstrates the relevance of these three components in producing change in categorization of mood, hence perception of them. It must be emphasized that they are sufficient to produce change in communication in a probabilistic sense i.e. insofar as the withdrawal of one of the original components changed the perception of the original communication in the majority of cases. This section of the hypothesis is accepted.

Hypothesis 2. Communication is dependent on personality.

Conclusion on Hypothesis 2.

The hypothesis encompasses a wide range of factors in the generic term "personality" so it is important to re-state that only the factors extraversion, neuroticism and lie were tested. The findings in the previous chapter suggest that there is a trend to greater neuroticism with age, so this characteristic is minimal in the youngest age group where the composer sample was located. Consideration

of communication can only fairly be made as between composers and listeners of this one age group and since it has been found (previous chapter) that the composer and listener groups are comparable in personality, any differences in the perception of mood between composers and listeners cannot be explained in terms of personality. Hence this hypothesis is rejected.

Hypothesis 3. Communication is dependent on the ability to disembed.

Conclusion on Hypothesis 3.

Within the constraints which are commented on elsewhere in this account, imposed by the type of embedded figure test employed, the finding in the previous chapter suggests that the composer and listener samples belonged to a homogeneous population as regards EFT skills. Any differences therefore in the perception of mood as characterized in the tunes cannot be explained in terms of disembedding ability. Accordingly this hypothesis is rejected.

Hypothesis 4. Children like ambiguous tunes more than they like unambiguous tunes.

Conclusion on Hypothesis 4.

In general, there is no consistent trend over moods in preferences in ambiguous over unambiguous tunes nor vice-versa. However, for Angry and Sad

moods, ambiguity is preferred in all age and sex groups whilst in Comical, Dreamy and Frightened tunes, there is some evidence for unambiguous tunes to be preferred. However, this finding does not apply to all age groups and both sexes. The hypothesis must be rejected.

II. Implications of Findings.

The outcome of change of mood was, in the main,not that a mood categorization changed to a different one but that it could change to a cluster of moods. Further, within a modification the fact that there was a limit to the variety of clustering is significant; after all, mathematically a change could have produced a large number of simple and complex clusters e.g. A to D, A to D,S, A to D,F,S, or A to C,D,F,S. The fact that there were complex clusters in preference to single mood clusters is noteworthy and this, together with the transforming effect which has received comment elsewhere serves to emphasize the complex nature of the musical experience. It points to the response to music being additive in that feelings seem to cohere, the resultant being rather like an intersection of sets; or it could be likened to the effect produced by two touching blocks of wet paint on moist paper as the touching edges begin to merge yet retain part of their identity in the new tint.

From the concept of clustering the idea of some ambiguity can be developed. That children should feel an element of congruence between moods lends a degree of affirmation to the view that music can be ambiguous in its embodiment. When it is inferred from the research that some pupils have a preference under certain conditions for this duality rather than unambiguity, the implication for teachers is that there may be a reason for this personal response which is worth investigating. More directly, perhaps it is as important to allow young children a choice in their musical diet ..... whether for listening or for performing ..... as it is to provide free choice of reading material. Teachers do not any longer stipulate what shall be read for pleasurable pursuit, since they have already found from experience that this often leads to less reading. Perhaps the parallel is that if it is thought desirable that more children should be led to experience the satisfaction to be found in music, opportunities should be provided for children to be given greater freedom to experiment, greater freedom to "dip" into music as into a book which is either rejected or read from cover to cover; and re-read, as fresh perceptions of the book's merits emerge. The inescapable corollary of that, is that many more facilities will be required and indeed many more musically well-educated teachers of music trained, than have existed in the past or do now. This in turn has implications for the whole curriculum, since political

decisions will now supervene;parents, employers and government each playing their roles which will certainly produce conflict, not only with regard to the hard facts of the deployment of available money but to less tangible arguments concerning the relative "importances" of each part of the curriculum to every other. However, the inescapable fact that the future will bring, of debatable benefit, more leisure time than ever before to a vast section of the population should surely cause speculation concerning what is going to occupy the intellect of all those for whom the nation has little work to offer. Those who know the deep fulfilment,contentment and satisfaction induced by the musical experience are in no doubt of the place of listening to, and particularly making, music as one agent in the process of bringing perspective to life experiences.

This research has served not only to shed more light upon the investigator's previous work (LEGGATT 1974) but in posing further questions it has indicated that a major part of the difficulty into researching into what listeners perceive in a musical input to their intellect is implied by REIMER (1970):

> "..... an art work should be approached for embodied meaning rather than designated meaning, perceived as a matrix of embodied meaning rather than designated meaning ....."

This points up the essential difference between the germinal concept the researcher had for this enquiry and

the ideas to which he moved. The 1974 enquiry already referred to, was based upon only those melodies which were demonstrated to have communicated, to have an agreed designation of mood, at a statistically acceptable level; those which did not were ignored and rejected from further consideration. That methodology was acceptable in the context of that research but proved unacceptable in the present context where all responses to the 80 tunes were considered. The reason why the present method is acceptable is to be found in the above quotation which, in suggesting that to seek embodied meaning is in some way preferable to seeking designated meaning, opens up the opportunity for the listener to be found "not incorrect" rather than "correct" in his responses. (Footnote). The implication therefore is that music which has been found unable to "designate" ..... for whatever reason ..... should not be considered as necessarily without aesthetic acceptibility. How to persuade children of that provides the music teacher

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From the standpoint of this research it needs perhaps to be stated to avoid any confusion of concepts that differentiation should be made between "embodied" in the sense used in the previous quotation and "embedded" in the sense implied by the test of embedded figures, used in this research. Whilst there can be no debate over the physical facts of a set of "embedded" tones, other than whether they are perceived or perceivable at all, there can be wide, and perhaps totally unresolved debate over the ..... may it be called metaphysical? ..... meaning of a musically "embodied" feeling.

with problems. However, it seems likely that the very "open-endedness" of Reimer's approach is likely to lead to a greater musical awareness and interaction because through it children, as already suggested, will be able to feel themselves more secure in being "not incorrect" in their responses.

That there is a "matrix of embodiment" can be inferred from the research. When a listener is compelled to attend to a particular set of musical components simply because another has been removed, his response to the music's embodiment changes. This implies that there was not a simple statement of content within the music, however that might be carried; or how could another embodiment now be found? The procedure, admittedly artificial, that was adopted may have been having the same effect as when one listener attends to one part of a composition and experiences a particular feeling while another listener, hearing ..... whatever that may mean ..... the same composition experiences differently because he does not attend to the same components in the music. Just what decides a listener to attend to one particular component rather than to another is an open question; or if all components are indeed receiving attention, why should particular components appear to be more obvious than others? Is this intrinsic in the way the composition was made or is it a function of the listening mechanism?

It has been recorded that each modification was effective in causing change in categorization, but although an indication of pattern was indicated, it was also demonstrated that there is a wide range of possible categorizations made by pupils. The reasons for this can be supported only by surmise but it may well be a matter of perception. The research could not cover all aspects of perceptual phenomena; amongst these is that concerned with the emphasis put by different observers on the same, or apparently the same, observation. It may well be that in a particular instance of listening to a tune, not all pupils emphasized the same characteristic in their mental route to making a mood characterization. E.g. some will have based a decision on speed, others on pitch, yet others on the interaction between the two. This assumes equality between listeners in other matters, such as motivation. Manifestly, this cannot be taken for granted.

The implication is that pupils' mood decisions in an aesthetic rather than semantic context, are influenced by much more than the music per se. Hence at a time when musical criticism has assumed some prominence, educationists anyway, must question whether there is value accruing from attempts to impose on "captive" audiences details concerning say, the structure of a piece of music, or to impose any suggestion of how the audience is supposed or expected to respond, if this is thought to

help children perceive what is embodied in the music, as distinct from discussion of musical form as part of compositional technique. Since there can be no certainty that the constructs within which pupils operate are identical across all listeners, there can be no certainty either that musical perceptions will even approximate anyway. Indeed, it may well be that this very difficulty is the one which prompts some to attempt a short cut by proposing a stipulative approach to "what the music is about".

It may well be that such desirable perceptions as may be wished for can be the product only of living more fully, of feeling more deeply, of delving even unconsciously into the experiences which a societal existence can provide. This then has implications for the balance in music education between input and output; the former being related to the teacher's best estimate of what he thinks a pupil should need, this being related to what each individual intuitively feels he needs. This has important implications for the place of creativity in music education. One such implication may be that a fine equilibrium exists between what is taught and how far particular reactions can be, or indeed should be expected to be produced, if natural creativity is to be nourished rather than inhibited.

With regard to the ambiguity experiment, certain implications for music education may be inferred. Within the limits of the enquiry, since it would appear that no firm conclusions regarding preferences for overall ambiguity or unambiguity can be drawn, the teacher of music should perhaps examine his personal rationale. If the teacher believes that what is composed should be "liked" by listeners, he may well infer from the evidence that no action should be taken by him to secure unambiguous Angry and Sad tunes, since listeners "like" such tunes to be ambiguous. It would be necessary however, to teach pupils how to compose Comical, Dreamy and Frightened tunes which are unambiguous. However, if the teacher shares the view of Stravinsky (1) who, writing of his "Symphonies of Wind Instruments" said:

> "This music is not meant to 'please' an audience or arouse its passions. I had hoped, however, that it would appeal to those in whom a purely musical receptivity outweighed the desire to satisfy emotional cravings."

he would then wish to know how to help his pupils compose their tunes unambiguously in order that a similar "receptivity" of the composer's thought could be ensured; and such "receptivity" of course, is essential for any musical communication to take place at all.

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(1) In his Autobiography.

III. Implications for Further Research.

1. Because of the presence of at least two factors in the modifications, any attempt to explain how changes in mood categorization are produced may have multiple interpretations. One explanation could be that the factors present independently and in an additive fashion produce change; alternatively, the factors present in an interactive fashion produce change. It may be possible to evaluate the validity of the two possible explanations empirically by designing an experiment so to do.

2. During the study of young children's original melodies, it was never far from mind that, whilst a limit had to be set on the number of variables that join together in any piece of music, nevertheless the absence of some consideration of these was bound to have its effect. In mind are, for example, dynamics, metre, pulse and timbre. In any further enquiry which includes a consideration of communication in music, it could well be profitable to take only one of these components specified or indeed, only one of those which were used, for a thorough-going analysis of possible effects.

3. The researcher found little choice in available personality tests, some of which were considered being out-of-print, or based on morbid psychology or not

specifically devised for present-day junior children. There would appear to be an opportunity here for such a test to be devised.

4. Tests of disembedding too, particularly those aural in design, are few. Indeed, although such may exists, it was only by chance that the one used was happened upon; and even then it was not devised as a disembedding test but as a recognition test. However such a test might be constructed, it is suggested that the task is properly that for a team approach so that the unique nuances of concept in the separate disciplines of music and psychology might be the better appreciated.

5. There is a need for some method of recording in visual form, the whole message which a musical phrase carries during its performance. The researcher was able to transcribe on the ms. paper his best record of the pitch of what had been composed together with conventional indications of speed, rhythm and, very approximately, the dynamics. However it is one thing to rejoice that every performance of a piece of music delights by its likeness to, yet difference from, a preceding performance; it is quite another to attempt for scientific purposes, an exact replication of the original in every acoustical respect. Had such a facility been available, the extraction of one component without the slightest alteration to the remaining

components would have been not only easier, but manifestly more truthful towards what remained.

6. Another device for which there could be use is one which will effect an alteration in the speed of music without at the same time causing a variation in pitch.

7. The transformations reported between the categorizations of some tunes suggest that one reason for the effect may be due to the listeners working with different constructs from each other. If the present enquiry were replicated with better facilities, or parts of it enquired into more deeply, it would be satisfying to be able to think that the children were working based upon as nearly as possible similar constructs. To this end an enquiry into what constructs children really have for their moods and emotions might be able to produce a form of taxonomy to which children could be asked to conform in making their judgments and thence their categorizations.

8. In both pieces of research undertaken by the investigator, a suspicion has constantly lurked that junior children attend spasmodically to the music they are required to assess. In particular, it is felt that when children realize that they are to listen to a series of musical phrases, they tend to make their decisions quickly,

based upon what they hear in the opening few seconds of the performance of each piece. Is this so, or do they in fact make an overall judgment?

9. The method of composing adopted by young children relies largely upon memory, since it is a trial and error process not amenable to committing to ms. paper. Now that the "silicon chip" era has arrived, is it beyond possibility to have a recording device which has a facility for erasing, as a tape recorder does at present,but can have the resulting space either removed, so that on replay no space is apparent, or lengthened or shortened to accommodate other information, without recourse to any form of mechanical editing? All within micro-seconds, naturally!

10. Many schools use movement and dance as creative and recreative activities. Invariably the music used is from the standard repertory ..... Prokofiev for "spikey" movement ..... or is electronically based. There is an avenue to be explored more deeply in the fusion of original dance with original music, either devised each separately but with the other in mind, or else proceeding simultaneously. There is already something like this done in schools but often the movement is to untuned percussion instruments, such as cymbals, triangles or drum. Rarely are children set the task of creating their own musical-movement

so that both may evolve as natural interacting outcomes of each other. It is suggested that CCTV be used in the preparatory work coupled with the use of the VCR., so that immediate "on-site" playback and re-appraisal can be made by the children themselves with the minimum of teacher guidance. A successful outcome to such a venture could be expected only if experiments were made into the practical method to be adopted. Then, when such method has been evolved and performance has been attained, there is the fascinating task of devising a method of assessing the result. From such an assessment, which would reveal shortcomings but also point forward, some type of curriculum which takes account of the age and ability of the children could be worked out. This would go some way towards providing a continuity in this form of creative activity.

IV. Final Observations.

Whatever else it may or may not have done, the enquiry has demonstrated an effective methodology for substantiating the investigator's main thesis that mood in music, at least as far as young children's original melodies are concerned, is perceivable, inter alia, because of a relationship between various musical components used by the composers. It has also hinted that the effect of certain components may be more readily discernible than others.

The research has also demonstrated the involved nature of the musical experience and, whilst the foregoing account gives little suggestion of it, the considerable difficulties involved in selecting appropriate statistical methods for defining what was thought to be taking place during the experiment. Part of the problem involved the lack of suitable measuring instruments relating to personality and aural perception.

Whilst it is a matter for regret not to have been able to have made categorical statements concerning which components define the character of particular moods, it has nevertheless been of some reward that children have shown some consensus in making responsive statements about the music which their peers had composed. Indeed, in many instances the strength of agreement revealed was considerable. However, the particularization of the component/mood relationship was not able to be much clarified because of a perceptual problem. On the face of it, it might be thought that if the withdrawal of one component produced change in categorization, then the change was a result of that withdrawal. This deduction is illusory; it is dependent on an important provision, viz. that the withdrawn component was in fact perceived before withdrawal. Such a perception could not be guaranteed, so the deduction was not able to be substantiated. Instead, it was felt to

be more reliable to refer the modified categorization not to the withdrawn component, but to those components remaining; at least this improved the odds that what remained received attention.

The consensus of agreement noted above was particularly noticeable with respect to the clustering of certain moods after modifications and this may indicate some agreement amongst children regarding the essential content of tunes and what they embody. Further, children seemed to sense some common bond between some moods which appeared to cause them to hang together. In turn this implies that children have the ability to make agreed aesthetic judgments; and presumably this ability must be the foundation for all creativity in music. AINSWORTH (1970) said:

> " ..... musical creativity is seen as a process of making informed decisions."

and if this is so, teachers must play their part in making such decisions informed ones. However, PAYNTER and ASTON (1970) caution:

> "As far as possible this work should not be controlled by a teacher. HIS role is to set off trains of thought and help the pupil develop his own critical powers and perceptions."

and YOUNG (1973) reminds of the teacher's vital role in the education of the senses but stresses that personal

experience linked with teaching are the two most important determinants of belief (vide: LUND 1925). Perhaps these will help to guide teachers between the Scylla of what DAVIES (1962) calls:

> " ..... imposing order in the ..... limitless chaos of musical possibilities by reducing the compositional process to the realization of pre-determined formulae ....."

and the Charybdis of what the same writer describes as:

> " ..... the other extreme, of leaving the composition process to 'chance' elements which process leads to complete musical meaninglessness ....."

The way to develop artistic beliefs is fraught with difficulties, not the least of which is how to inform without at the same time imposing a personal judgment. Some positive guidance is supplied by REIMER (1970):

> "..... the most important role of music education as aesthetic education is to help children become progressively more sensitive to the elements of music which contain the conditions which can yield insights into human feelings. These elements ..... the expressive qualities of melody, harmony, rhythm, tone color, texture, form ..... are totally objective; they are identifiable, nameable, capable of being manipulated, created, discussed, isolated, reinserted into context. There is nothing mystical about musical events and how they give rise to a sense of significance. While the affective response to aesthetic elements in music is indeed ineffable, the elements which can arouse the responses are not."

The point has now been reached at which it is possible to state explicitly that what follows is a concluding description of the theoretical framework underpinning the empirical work reported in this thesis. The framework included three levels of perception, viz. physical stimulus, pattern and mood. That the following statement should appear at the end of the thesis rather than at the beginning seemed inevitable to the writer if he were to avoid prejudicing the ideas reported in the literature of the subject.

The sensitivity to the musical elements to which REIMER (op. cit.) draws attention can develop only through the perceptions of each listener. In these perceptions the three above-named levels discernible, although able to be separately identifiable, nevertheless "nest" and interact in the overall perception.

1. Immediately obvious are the physical perceptions and these were available to both composers and listeners in the sample. These children perceived the pitch of the glockenspiel notes, they must, either unconsciously or in full awareness, have noticed that the timbre of the instrument was unique, not like the timbre of, say, a trumpet or stringed instrument. They may have heard that there was a decrement in note volume which was of variable duration depending on the initial percussive beat they used and indeed that it was possible to play loudly or softly. However, at this level the physical elements available could only promise that music could under some circumstance be realizable. A parallel might be drawn with the sounding of an organ pipe today by the tuner whose attention to it makes possible the rendition of an accepted musical work tomorrow, (SWANWICK, 1973). The physical parameters set by the individual, characteristic elements of for example pitch, timbre, volume impose constraints; in themselves they are not communicative as music; they only specify pitch, timbre and volume. However, there is a promise somehow inherent in them, and with them the association of other physical aspects, such as rhythm, that they can become recognizably musical. The individual elements of the physical components can be given

coherence to produce what people may accept as music. In short the sand, cement and bricks can become a wall.

The way in which the structure appears however, whether in walls or music, is not a chance and random happening. Were this so, it is unlikely that the differing characters of the tunes would have appeared; the tunes would have been uniform in character, somewhat akin to the apparent sameness of "white noise". The pupils in the composers' sample made decisions, for instance, as to what note to begin with, what it should be followed by, the degree of percussion to be adopted and so forth. The listeners for their part, made decisions, albeit unconsciously, concerning the rise and fall of the musical line, about the movement of the notes and so on. This implies that both composers and listeners were aware of, they imposed, a structure and made intellectual observations on the sounds they heard. These observations would lead the composers and listeners to believe that the musical message, however it might be read, was what was intended and implied. (Vide BEARDSLEY 1958; p.42 this research). Furthermore, the stimulations provided individually by each physical characteristic became organized into a unique experience; the awareness of the stimuli encourages percepts within the listener so that --- using the wall analogy again --- he can say: "At this point the elements of sand, cement and bricks have been brought together to be a high wall; at this point, the wall curves; now it straightens in a low section and here finishes with a pillar." As DREVER (1960; p.47 this research) makes clear, the stimulations in music become an orderly account. The musical elements take up their perceivable form. This leads directly to the second level of perception, which earlier received attention.

2. When the organization within music becomes noticeable (BEARDSLEY, op. cit.) it is a matter for speculation where it comes from, and indeed, why it shapes itself anyway. Consideration of this moves the discussion from the physical level to the psychological. It is now accepted (vide BEARDSLEY 1958 and WYBURN et al 1964; p.42 this research) that the receiver of the music's information imposes

his own patterns on the aural perception. This raises again (p.47 this research) how illusory and sometimes fleeting, the patterns are. "Now you see them, now you don't." But to understand and have knowledge of even changing patterns requires pattern perception,and within this, it is essential that listeners have a developed sense of pattern discrimination. This points up the need for young children to have opportunity critically to develop through their own explorations, and with guidance, the skills implied --- such as the ability to recognize strong and weak beats, 'feel' pulse and absorb a basic vocabulary of rhythmic patterns which they can make their own to use in their creative music work. Concept and percept are interactable in this. In this enquiry,the children had access to their vocabulary of patterns and chose how to use them in their efforts to embody given moods in their compositions. The fascinating, but alas! unanswered question, remains: "What patterns --- if indeed there are specific patterns at all --- are used to embody particular moods?" The stimulus patterns were there, the symbol system was available and apparently the encoding and decoding operation, which requires agreement of the system's basis (LEGGATT 1974) operated, but just how does the communication come about? It may be that, IF music is like language, there is a general acceptance of the labels applied to moods --- and this is by way of social agreement. In language, the acceptance is for instance that the information implicit in "C-O-M-I-C-A-L" provides the listener with the agreed label for an agreed feeling; but in music, while it seems that the same process functions, the equivalent musical components that provide the label, remain elusive; a straightforward "cause-effect" system it has not been possible to demonstrate.

3. The word "Music" in the title to this thesis brings to mind notions of mood, emotion and aesthetics. A third level of perception is possibly nearer the second idea implicit in the title viz. "Communication" and prompts thought about what music means. (REID 1969; p. 104 this research). A strategy to attempt clarification of this notion, may stem in recent work in part from ideas of MYERS (1927) and ADCOCK (1964), (pp. 48 and 49 this research) and suggests there may be more common ground in linking music

with the experience of listeners, with seeking to know of what it reminds them, what extra-musical experiences are recalled.

As "perception" is central to music, so is "meaning" to communication (vide ADCOCK 1964; p.51 this research). Whatever a musical statement may "mean" to a listener, it is related to level two of his perception, in that awareness of the music's patterns is a necessary part of the chain of events in the business of "appreciating" music, whatever that may mean. However, the <u>meaning</u> which may follow from audition, is something which the listener imposes; it cannot reside in the music (c.f. "beauty" in music, p.55 this research), although the composer may include symbols which, if mutually agreed as valid, provide clues to meaning. Meaning in music is probably at least in part socially determined, a matter of convention, but since listeners will bring their own judgments and interpretations into operation, there is not a one-to-one correspondence between symbol and adduced meaning and this is evident in this research. This is a circumscribing effect which sets limits to inferences of meaning. Indeed, it is possible that complete disagreement of what a musical statement means will happen and this may result from factors in the personalities of the composer, an individual listener and listeners as a group.

The physical features of music referred to in level one above will modify what listeners can socially accept as communication of a composer's thought. In this research the inference to be drawn is that for example, where a tune is pitched will mean different things to different people (breakdown of communication) or substantially the same thing (communication). The amount of the modification effected in level one is an empirical matter and this research attempted to investigate, amongst other things, this aspect of communication; the experimental manipulation of some physical components did in fact, indicate how meaning was amenable to change. Where speed was changed, the hypothesis of BRUNER (1957; p.37 this research) and in the case of the variables pitch and rhythm, the hypotheses of ANASTASI (1958; p.37 et seq this research) and MOLES (1968; p.148 this research) were invoked and in general terms were seen to be substantiated.

With these final comments concerning perception and meaning as affecting communication in music, the reseacher has by reference to them indicated his belief in the crucial part each, singly and together, plays in the understanding of music. Consideration of these together with the other matters dealt with in this research may help all those committed to music education to agree the proposition by GORDON (1971) who claimed:

> "The general purpose of music education, then, should be to teach for musical understanding ..... that is, to help students conceptualize the elements of music so that they may intelligently decide for themselves how music can best satisfy their needs."

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Appendix

Note on the Transcription of Tunes.

Transcription of Tunes.

In order that the modified tunes could be produced by the investigator, it was necessary to have a visual record of what the children had composed. There are well-known hazards in transcribing on to paper from performance. Some of these are relevant to the procedure adopted by the researcher. Possibly because of the complex physical structure of the sound emitted by a glockenspiel, the investigator found some difficulty on occasion in deciding on the pitch of a particular note. Further, certain notes did not seem to be accurately tuned; this may not be surprising when it is known that the instruments used were not of high orchestral quality, being in fact instruments produced for general school use. It is well-known too, that young pupils do not feel impelled always to adopt sophisticated, and probably learnt, rhythmic and pulse conventions. They make variations, perhaps deliberately, perhaps accidentally, in the steadiness of the underlying beat of their music. There were also a very few occasions when the child struck the wood at the extreme ends of his instrument. In transcribing the music on to ms. paper, the investigator assumed that the child intended to hit the note adjacent to the wooden end and he therefore wrote in that note. It is emphasized that this type of inaccuracy was rare, occurring probably not more than half-a-dozen times in all the 300 tunes produced.

The investigator's attempts to play the glockenspiel according to the visual record and also from aural memory must perforce have added to the inaccuracies already noted. The notes themselves, as far as pitch is concerned, could of course be accurately read. If wrong notes were struck by the researcher when the tapes were being made, it was a simple if time-consuming procedure to erase the tune and then record again. The main problem was found in the attempted remembering of the child's intentions as regards, forexample,

dynamics, and to incorporate these. There were other difficulties, such as the 'shading' of pulse and speed, with the problem of trying to match these with as much accuracy as possible. HICKMAN (1975) says:

> "..... there has been comment in the literature about the subjective transformations of the performance occuring when transcribed by a musician who can 'rationalize' such performances without his being conscious that he is doing so. Ainsworth and I referred to this danger in reporting on our work with children's created melodies ..... and we devised means for transcribing rhythms electronically ....."

Hickman continues with the observation that pitch, being unambiguous on the glockenspiel, does not present much problem. He makes interesting comment however in the following; referring to the electronic recording of rhythm, he says:

> "We found that the observed coding of note-durations could not be classified by the computer because they were ambiguously assignable to 'crotchet' or 'quaver' lengths. Yet on replaying such melodies we found we would have assigned them such lengths without further thought. This experience raises questions as to how much such errors are due to imperfect rhythmic performing skills, and how much they were deliberately intended by children ignorant of the niceties of conventional rhythmic patterning."

Reference to the annotations of some of the 80 melodies will show that apparent key signatures are written in. The investigator does not consider that the pupils' music necessarily falls into readily identifiable and conventional key. The apparent signature serves the function only of making easier and less complicated the annotating of the played notes. It will be appreciated that had this procedure not been adopted, the score would have been a mass of

accidentals, including cancelling and re-establishing. Whilst in some cases it would have been possible to adopt an unconventional signature, it was found less foreign to the investigator's training to adopt conventional signatures. In any case, since the children's music often did not imply conventional key, whether a note were annotated in a specific way or enharmonically was a matter for a purely arbitrary decision by the researcher, who bore in mind that he was dealing with an instrument each of whose notes, being pre-determined, could not be subjected to any pitch variation such as might be suggested by the mental effect between say, A sharp and B flat.

Note on the Personality Profiles.

Personality Profiles.

A small sample of pupils was taken and aspects of personality, as observed by each child's teacher, were noted. In order to secure some degree of uniformity over the factors considered, the Bristol Social Adjustment Guides were used. Their author (STOTT 1976) warns that the Guides:

> "..... should not be regarded as a measure of 'personality' in the traditional sense, if only for the reason that this word prompts us to search for some essense of a person's nature for which there is no empirical evidence."

It has to be said vis-a-vis this research that the only reason for using the Guides was considered to be the common yard-stick they provided by supplying statements on well-defined areas of child behaviour which could be commented on by each child's teacher. No empirically-based findings can be adduced from the use of the Guides and the profiles drawn of the small number of pupils are included in this appendix purely as a matter of human interest as regards some of the subjects used.

Boys and girls were chosen in two groups. One group consisted of composers whose tunes had demonstrated maximum efficiency, as measured by percentage

of listeners who categorized the mood as intended by the composer. The other group was formed by those whose compositions showed minimum efficiency in categorization of intended mood.

1. Efficient boy composers.

Subject no. 1.

He never thinks of greeting his teacher and is not sufficiently sociable to help the teacher with classroom jobs. He gets confused and tongue-tied when answering questions. He couldn't bother to ask for his teacher's help and indeed, will avoid the teacher if possible. He has only one child as a friend, ignoring the rest. His attitude to the teacher is negative; in fact he strives for disapproval, deliberately misbehaving when the teacher is engaged with others. If he is hurt or wronged, he never appeals to an adult. He responds to correction momentarily but quickly reverts to his former behaviour.

He is apathetic to his work and if not completely indifferent, he 'flits' between tasks. He will work only if watched. He is sly, hitting younger children if he thinks he can get away with it.

This child seems to be shuffling his feet constantly and is always changing his position. He is clumsy and has

poor motor co-ordination, but this may be accountable by his unusual height with regard to age. His free speech is largely rambling chatter.

The general impression given is of a child who shows symptoms particularly of depression and hyper-activity with some suggestion of behaviour deviance from social norms.

Subject no. ii.

This boy enjoys a quiet relationship with his teacher most of the time. He doesn't actively seek positive help, but will attract attention by continued misdemeanour. He will do anything but work, unless he is watched. In learning new tasks, he has a hit-and-miss approach.

He is out-going at games, but mixes with unsettled types, and squabbles with them and insults them. He can fly into a temper and stand up for himself, often being the centre of trouble.

The general impression is of a child of inconsequential, provocative behaviour in defiance of social norms.

Subject no. iii.

A moody boy who seeks disapproval by openly behaving badly in full view of his teacher. He mutters resentfully when corrected.

He works steadily and shows perseverance in free activities, appearing to like a difficult challenge. He

wants to mix with children but squabbles with and insults some while getting on well with others. He can fly into a rage if provoked, standing up for himself. In games, he tends to be boisterous and rough and will spoil others' activities.

The general impression is of a hostile, provocative and aggressive boy, who strongly over-reacts.

2. Inefficient boy composers.

Subject no. iv.

This boy's behaviour towards his teacher allows little interaction. He is pleasant, smiles naturally and readily, but doesn't demand attention or approval. He makes no fuss, is well-behaved, truthful and meekly accepts correction if it is ever given.

He works well with perseverance.

His games activities show sensible behaviour and he fits the team well. He is sociable and kind to other pupils and when with them he conforms to discipline.

He sits quietly and still, respects others' property and displays no deviant behaviour.

The general impression is one of a conforming child but it is known that all his academic work is of low grade.

Subjects nos. v to vii.

The three other boys studied in this group were like Subject no. iv, being similarly conforming and free of deviance.

3. Efficient girl composers.

Subject no. viii.

A girl who behaves well in a restrained, pleasant manner to the teacher at all times. If she has to be corrected, the response is positive.

Good academically, she devotes her attention to her work which, even if cautiously approached initially, receives persevering treatment.

She plays games energetically and sensibly; a good team player. She mixes well and is kind and helpful to her peers.

She is a well-balanced girl, attractive and of medium physique.

The general impression is of a girl who conforms to the accepted norms in all respects.

Subjects nos. ix and x.

Both these girls were similar to subject no. viii in their acceptance of the norms of good behaviour.

4. Inefficient girl composers.

Subject no. xi.

This girl, appreciative of praise and attention, is normally talkative with her teacher with whom she enjoys a good relationship. Her academic work is but average, being approached in a cautious manner. She is difficult to stimulate in free activities. She is not a 'sporty' type and although a good mixer, she is too timid to stand up for herself in any argument.

She is careful with her property and respectful of other peoples'. Of normal height for her age she is nevertheless very thin.

The general impression is of a girl who is prepared to conform to the accepted norms of good behaviour.

Subjects nos. xii and xiii.

Both these girls impressed as being conventional in good behaviour and normally adaptive to people and situations.

Conclusion.

It cannot escape notice that the first group reported on, appears more deviant than any of the other three. If this fact prompts any inference at all, it should

be modified by the realization that the numerical size of the sample is too small for secure judgments to be made, but the hint may be that a deeper investigation along the lines indicated may uncover further information.

Tables.

Tables not listed within
appear in the chapters
to which they apply.

3.1. Frequency of Categorization. MOD 1.

TABLE 3.1

Frequency of
Categorization.

MOD1	Same		Different	
Tune	Frequency	Percentage	Frequency	Percentage
1	70	39.10	109	60.90
2	57	31.84	122	68.16
3	92	51.39	87	48.61
4	61	34.07	118	65.93
5	64	35.75	115	64.25
6	53	29.60	126	70.40
7	56	31.28	123	68.72
8	50	27.93	129	72.07
9	47	26.25	132	73.75
10	59	32.96	120	67.04
11	52	29.05	127	70.95
12	78	43.57	101	56.43
13	52	29.05	127	70.95
14	62	34.63	117	65.37
15	98	54.74	81	45.26
16	54	30.16	125	69.84
17	39	21.78	140	78.22
18	86	48.04	93	51.96
19	55	30.72	124	69.28
20	63	35.19	116	64.81
21	71	39.66	108	60.34
22	64	35.75	115	64.25
23	44	24.58	135	75.42
24	74	41.34	105	58.66
25	56	31.28	123	68.72
26	68	37.98	111	62.02
27	42	23.46	137	76.54
28	47	26.25	132	73.75
29	71	39.66	108	60.34
30	51	28.49	128	71.51

TABLE 3.1 (cont'd)

	Same		Different	
Tune	Frequency	Percentage	Frequency	Percentage
31	46	25.69	133	74.31
32	39	21.78	140	78.22
33	47	26.25	132	73.75
34	56	31.28	123	68.72
35	67	37.43	112	62.57
36	51	28.49	128	71.51
37	41	22.90	138	77.10
38	55	30.72	124	69.28
39	62	34.63	117	65.37
40	52	29.05	127	70.95
41	53	29.60	126	70.40
42	64	35.75	115	64.25
43	46	25.69	133	74.31
44	46	25.69	133	74.31
45	52	29.05	127	70.95
46	46	25.69	133	74.31
47	61	34.07	118	65.93
48	56	31.28	123	68.72
49	61	34.07	118	65.93
50	48	26.82	131	73.18
51	43	24.02	136	75.98
52	51	28.49	128	71.51
53	46	25.69	133	74.31
54	60	33.52	119	66.48
55	56	31.28	123	68.72
56	63	35.19	116	64.81

TABLE 3.1 (cont'd)

	Same		Different	
Tune	Frequency	Percentage	Frequency	Percentage
57	61	34.07	118	65.93
58	43	24.02	136	75.98
59	70	39.11	109	60.89
60	52	29.05	127	70.95
61	55	30.72	124	69.28
62	45	25.13	134	74.87
63	43	24.02	136	75.98
64	45	25.13	134	74.87
65	45	25.13	134	74.87
66	60	33.52	119	66.48
67	49	27.37	130	72.63
68	42	23.46	137	76.54
69	43	24.02	136	75.98
70	68	37.99	111	62.01
71	53	29.60	126	70.40
72	50	27.93	129	72.07
73	35	19.55	144	80.45
74	68	37.99	111	62.01
75	48	26.82	131	73.18
76	59	32.96	120	67.04
77	59	32.96	120	67.04
78	63	35.20	116	64.80
79	63	35.20	116	64.80
80	56	31.28	123	68.72

3.2. Frequency of Categorization. MOD 2.

TABLE 3.2

Frequency of Categorization

MOD2	Same		Different	
Tune	Frequency	Percentage	Frequency	Percentage
1	46	25.69	133	74.31
2	56	31.28	123	68.72
3	34	18.99	145	81.01
4	37	20.67	142	79.33
5	69	38.54	110	61.46
6	56	31.28	123	68.72
7	17	9.49	162	90.51
8	32	17.87	147	82.13
9	36	20.11	143	79.89
10	36	20.11	143	79.89
11	50	27.93	129	72.07
12	36	20.11	143	79.89
13	39	21.78	140	78.22
14	49	27.37	130	72.63
15	40	22.34	139	77.66
16	34	18.99	145	81.01
17	49	27.37	130	72.63
18	89	49.72	90	50.28
19	56	31.28	123	68.72
20	49	27.37	130	72.63
21	47	26.25	132	73.75
22	73	40.78	106	59.22
23	39	21.78	140	78.22
24	29	16.20	150	83.80
25	47	26.25	132	73.75
26	54	30.16	125	69.80
27	51	28.49	128	71.51
28	36	20.11	143	79.89

TABLE 3.2 (cont'd)

	Frequency of Categorization			
	Same		Different	
Tune	Frequency	Percentage	Frequency	Percentage
29	39	21.78	140	78.22
30	46	25.69	133	74.31
31	40	22.34	139	77.66
32	31	17.31	148	82.69
33	43	24.02	136	75.98
34	30	16.75	149	83.25
35	45	25.13	134	74.87
36	50	27.93	129	72.07
37	50	27.93	129	72.07
38	42	23.46	137	76.54
39	51	28.49	128	71.51
40	42	23.46	137	76.54
41	54	30.16	125	69.84
42	39	21.78	140	78.22
43	40	22.34	139	77.66
44	32	17.87	147	82.13
45	46	25.69	133	74.31
46	54	30.16	125	69.84
47	38	21.23	141	78.77
48	35	19.55	144	80.45
49	50	27.93	129	72.07
50	49	27.37	130	72.63
51	43	24.02	136	75.98
52	49	27.37	130	72.63
53	48	26.82	131	73.18
54	35	19.55	144	80.45
55	46	25.69	133	74.31
56	49	27.37	130	72.63

TABLE 3.2 (cont'd)

	Frequency of Categorization			
	Same		Different	
Tune	Frequency	Percentage	Frequency	Percentage
57	41	22.90	138	77.10
58	31	17.31	148	82.69
59	34	18.99	145	81.01
60	60	33.52	119	66.48
61	51	28.49	128	71.51
62	38	21.22	141	78.77
63	44	24.58	135	75.42
64	40	22.34	139	77.66
65	52	29.05	127	70.95
66	29	16.20	150	83.80
67	43	24.02	136	75.98
68	44	24.58	135	75.42
69	36	20.11	143	79.89
70	31	17.31	148	82.69
71	41	22.91	138	77.09
72	35	19.55	144	80.45
73	31	17.32	148	82.68
74	43	24.02	136	75.98
75	36	20.11	143	79.89
76	38	21.33	141	78.77
77	45	25.14	134	74.86
78	48	26.82	131	73.18
79	41	22.91	138	77.09
80				

3.3 Frequency of Categorization. MOD 3.

TABLE 3.3

MOD3	Same		Different	
Tune	Frequency	Percentage	Frequency	Percentage
1	66	36.87	113	63.13
2	54	30.16	125	69.84
3	38	21.22	141	78.78
4	54	30.16	125	69.84
5	61	34.07	118	65.93
6	22	12.29	157	87.71
7	51	28.49	128	71.51
8	42	23.46	137	76.54
9	57	31.84	122	68.16
10	65	36.31	114	63.69
11	42	23.46	137	76.54
12	87	48.60	92	51.40
13	38	21.22	141	78.77
14	44	24.58	135	75.42
15	51	28.49	128	71.51
16	59	32.96	120	67.04
17	21	11.73	158	88.27
18	52	29.05	127	70.95
19	16	8.93	163	91.07
20	37	20.67	142	79.33
21	56	31.28	123	68.72
22	36	20.11	143	79.89
23	31	17.31	148	82.69
24	46	25.69	133	74.31
25	45	25.13	134	74.87
26	75	41.89	104	58.11
27	56	31.28	133	68.72
28	34	18.99	145	81.01

TABLE 3.3 (cont'd)

	Same		Different	
Tune	Frequency	Percentage	Frequency	Percentage
29	40	22.34	139	77.66
30	63	35.19	116	64.81
31	28	15.64	151	84.36
32	46	25.69	133	74.31
33	39	21.78	140	78.22
34	50	27.93	129	72.07
35	64	35.75	115	64.25
36	39	21.78	140	78.22
37	46	25.69	133	74.31
38	26	14.52	153	85.46
39	27	15.08	152	84.92
40	55	30.72	124	69.28
41	37	20.67	142	79.33
42	45	25.13	134	74.87
43	57	31.84	122	68.16
44	58	32.40	121	67.60
45	52	29.05	127	70.95
46	46	25.69	133	74.31
47	69	38.55	110	61.45
48	51	28.49	128	71.51
49	71	29.66	108	60.34
50	53	29.60	126	70.44
51	47	26.25	132	73.75
52	45	25.13	134	74.87
53	34	18.99	145	81.01
54	32	17.87	147	82.13
55	59	32.96	120	67.04
56	35	19.55	144	80.45

TABLE 3.3 (cont'd)

	Frequency of Categorization			
	Same		Different	
Tune	Frequency	Percentage	Frequency	Percentage
57	23	12.85	156	87.15
58	49	27.37	130	72.63
59	33	18.44	146	81.56
60	55	30.72	124	69.28
61	27	15.08	152	84.92
62	25	13.97	154	86.03
63	44	24.58	135	75.42
64	44	24.58	135	75.42
65	46	25.69	133	74.31
66	63	35.20	116	64.80
67	24	13.41	155	86.59
68	51	28.49	128	71.51
69	31	17.31	148	82.69
70	35	19.55	144	80.45
71	38	21.22	141	78.77
72	41	22.91	138	77.09
73	27	15.08	152	84.92
74	64	35.75	115	64.25
75	64	35.75	115	64.25
76	51	28.49	128	71.51
77	48	26.82	131	73.18
78	30	16.76	149	83.24
79	47	26.26	132	73.74
80	57	31.84	122	68.16

3.4. MOD 1 v MOD 2 v MOD 3

TABLE 3.4

	MOD1	MOD2	MOD3
Var. of %age change	42.84	32.92	60.19
Standard deviation	6.55	5.74	7.76
Mean %age of change	68.72	75,82	74.40
Odds of change	2.31:1	3.14:1	2.91:1

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15.1. Clusters resulting from MOD 1.

TABLE 15.1

Clusters resulting from MOD 1

Tune no.	Overall chi-sq.	Part'n'd chi-squares		Change from l.to r.
2	14.71	13.52		CDS AF
4	12.38	11.10		CDS AF
5	12.43	11.81		CDS AF
29	16.22	14.60		CDS AF
41	7.55	6.89		CDS AF
49*	14.82	8.72		CDS AF
76	23.30	21.18		CDS AF
80	8.50	5.48		CDS AF
10	5.14	5.09		AFS CD
12	6.96	6.86		AFS CD
17	21.44	10.26	11.15	AF S CD
20	9.90	6.53		AFS CD
26*	10.70	6.54		AFS CD
38	10.63	8.90		AFS CD
44	10.92	4.83	3.51	AF S CD
46	9.40	6.27		AFS CD
47	35.40	6.65	26.88	AF S CD
50*	9.40	4.53		AFS CD
59*	17.43	7.50	5.80	AF S CD
14	33.74	13.06	19.27	CDS F A
18	30.13	8.11		CDS F A
25	18.11	11.91	5.00	CDS F A
33	5.58	4.83		CDFS A

* Further partitioning produces no decisions.

TABLE 15.1 (cont'd)

Tune no.	Overall chi-sq.	Part'n'd chi-squares			Change from l. to r.
1	20.66	11.03	8.33		AFS D C
3	70.41	20.90	48.85		AFS D C
13	24.44	15.70	5.03		AFS D C
22	5.92	4.54			DFS A C
45	9.40	6.22			ADFS C
54	6.48	5.67			ADFS C
74	25.47	21.32	3.90		AFS D C
77	52.27	12.84	4.85	34.39	AS F D C
15	22.64	13.54	8.12		AF DS C
21	31.09	8.20	17.45	5.01	AF S C D
24	41.32	7.18	24.90	8.64	AF S D C
34	53.20	7.87	44.27		AF DS C
35	24.06	13.01	10.84		AF DS C
70	26.93	11.55	13.91		AF DS C
73	21.51	9.12	6.24	6.15	S AF D C
39*	12.51	8.27			AF CDS
40*	11.18	6.81			AF CDS
19	16.93	10.68			CD AFS
23	5.20	3.98			ACF DS
27	10.76	9.19			ACS DF
28	4.76	4.56			DS ACF

* Further partitioning produces no decision.

TABLE 15.1 (cont'd)

Tune no.	Overall chi-sq.	Part'n'd chi-squares		Change fro l. to r.
31	6.19	4.55		CS ADF
36	8.11	5.11		ACF DS
51	5.05	4.81		CF ADS
52	5.93	3.87		ACDF S
53	7.93	6.63		FS ACD
56	6.19	3.50		F ACDS
61*	17.49	12.83		ACF DS
63	11.58	7.70	3.84	A CS DF
69	5.69	4.88		ACF DS
72	8.19	8.10		DS ACF
79	8.83	8.13		ACF DS

* Further partitioning produces no decision.

TABLE 15.1 (concl'd)

Tune no.	Overall chi-sq.	Part'n'd chi-squares	Change from l. to r.
6	3.34		No pattern of change
7	3.76		
8	2.90		
9	3.40		
11	1.09		
16	3.58		
30	2.58		
32	2.43		
37	2.62		
43	3.16		
48	5.69		
55	3.12		
57	4.28		
58	4.49		
60	4.71		
62	2.71		
64	4.80		
65	1.92		
66	4.58		
67	2.40		
68	5.73		
71	2.94		
75	2.60		
78	3.17		

15.2. Clusters resulting from MOD 2.

TABLE 15.2

Clusters resulting from MOD 2

Tune no.	Overall chi-sq.	Part'n'd chi-squares			Change from l. to r.
2	15.15	13.41			CDS AF
13	14.69	11.71			CDS AF
15	21.33	11.06	7.91		DS C AF
18	14.52	12.08			CDS AF
22	10.75	8.56			CDS AF
32	12.85	9.36			CDS AF
53	13.36	9.74			CDS AF
59	10.34	8.94			CDS AF
70	9.78	7.11			CDS AF
71	4.98	4.29			CDS AF
1	29.50	13.98	11.54	3.97	DS C F A
9	22.48	15.40	7.05		CDS F A
11	36.56	20.78	14.79		CDS F A
14	25.04	8.25	16.70		CDS F A
27	18.34	7.25	8.74		CDS F A
33	6.90	4.05			CDFS A
46	32.32	14.02	16.41		CDS F A
54	12.50	4.66	7.20		CDS F A
39	7.37	4.80			CD AFS
62	7.08	4.93			CD AFS

TABLE 15.2 (cont'd)

Tune no.	Overall chi-sq.	Part'n'd chi-squares			Change from l. to r.
8	8.43	4.68			AF CDS
16	8.96	7.62			AF CDS
29	20.12	9.02	8.67		AF DS C
72	21.78	14.52	7.19		AF DS C
21	8.80	6.23			ACDS F
6	4.94	3.89			ACF DS
17	4.36	4.23			A CDFS
20	20.28	11.87	7.59		DF S AC
23	8.65	4.01	3.93		A FS CD
30	5.92	4.33			AC DFS
40	11.70	10.95			CDF AS
49	8.68	8.15			DS ACF
50	8.17	7.82			AC DFS
55	16.50	15.08			ACDF S
56	10.95	9.00			ADF CS
57	8.27	7.40			CDF AS
58	4.75	4.43			ACD FS
60	6.75	4.78			D ACFS
61	12.57	11.04			C ADFS
65	13.56	12.75			ADS CF
69	5.69	4.88			ACF DS
73	21.51	9.12	4.59	6.15	S AF D C
74	21.56	14.28	5.31		CD A FS
77	7.27	6.98			ADF CS

TABLE 15.2 (cont'd)

Tune no.	Overall chi-sq.	Part'n'd chi-squares	Change from l. to r.
3	4.40		No pattern of change
4	5.86		
5	4.57		
7	1.54		
10	4.62		
12	3.44		
17	4.36		
19	2.93		
24	3.86		
25	3.46		
26	1.98		
28	4.91		
31	2.54		
34	2.92		
35	0.58		
36	4.05		
37	7.37		
38	4.93		

TABLE 15.2 (concl'd)

Tune no.	Overall chi-sq.	Part'n'd chi-squares	Change from l. to r.
41	3.08		No pattern of change
42	2.81		
43	1.86		
44	1.05		
45	3.55		
47	3.02		
48	2.05		
51	1.99		
52	5.24		
63	3.24		
64	3.37		
66	1.60		
67	0.51		
68	4.11		
75	4.71		
76	3.99		
78	1.93		
79	2.01		
80	4.17		

15.3. Clusters resulting from MOD 3.

TABLE 15.3

Clusters resulting from MOD 3 (Faster)

Tune no.	Overall chi-sq.	Part'n'd chi-squares		Change from 1. to r.
6	15.16	4.46	5.49	4.86	A FS D C
12	121.44	12.16	108.94		AF DS C
17	16.31	11.67	1.74		ADFS C
19	73.38	71.85			ADFS C
20	44.19	40.02	3.63		ADFS C
23	27.43	15.26	12.00		AS DF C
24	101.10	99.18			ADFS C
31	10.59	11.29			DS AF C
34	31.64	20.67	4.52	5.05	DS F A C
35	46.73	22.81	23.57		AS DF C
36	25.85	22.55			ADFS C
39	15.89	10.09	5.59		DS AF C
40	38.58	29.55	7.56		AFS D C
42	28.55	18.00	8.87		DS AF C
43	34.77	16.77	17.74		DS AF C
46	11.67	10.93			ADFS C
49	33.33	25.62	5.78		DS AF C
51	14.60	8.16	6.20		AFS D C
55	132.62	132.31			ADFS C
57	34.76	32.50			ADFS C
61	49.60	48.65			ADFS C
66	58.10	55.32			ADFS C
69	25.20	21.89			ADFS C
72	25.68	20.16	4.06		DS AF C
74	124.46	123.24			ADFS C
78	9.98	9.74			ADFS C

TABLE 15.3 (cont'd)

Tune no.	Overall chi-sq.	Part'n'd chi-squares			Change from l. to r.
27	26.42	15.09	11.32		DS F AC
52	16.02	11.73	4.21		FS D AC
2	44.65	40.35	4.25		CDS F A
45	16.85	10.91	4.69		CDS F A
62	39.12	32.63	6.46		DS CF A
33	19.05	15.91			CDS AF
41	7.34	4.62			DS ACF
44	5.10	4.90			AFS CD
50	22.52	4.52	3.94	13.84	AF C S D
63	16.80	15.07			CDS AF
64	16.23	13.91			DS ACF
68	6.99	4.05			CDS AF
79	6.44	6.20			ACS DF
37	3.94				No pattern of change
67	2.71				.. ..

TABLE 15.3 (cont'd)

Clusters resulting from MOD 3 (Slower)

Tune no.	Overall chi-sq.	Part'n'd chi-squares		Change from l. to r.
3	24.54	23.51		ACF DS
13	28.96	22.10		AC F DS
21	34.27	33.94		ACF DS
32	15.24	13.40		ACF DS
38	20.09	19.01		ACF DS
47	13.89	12.29		ACF DS
48	21.98	21.67		ACF DS
56	25.76	22.55		ACF DS
58	7.96	7.04		ACF DS
70	18.67	18.34		ACF DS
71	15.05	11.31		ACF DS
73	13.32	7.37	4.24	AC F DS
77	9.24	8.95		ACF DS
26	18.26	13.94	5.33	ACF S D
54	25.80	17.20	8.52	ACF S D
59	22.65	14.10	8.31	ACF S D
65	24.64	19.48	4.53	ACF D S
28	41.01	28.25	9.03	AC DF S
30	19.38	13.51	4.25	ACD F S
11	8.82	7.17		AC DFS
53	13.57	5.58	5.69	C A DFS

TABLE 15.3 (concl'd)

Tune no.	Overall chi-sq.	Part'n'd chi-squares		Change from l. to r.
10	12.14	9.45		AFS CD
15	5.74	4.47		AFS CD
80	29.07	19.80	6.17	AF S CD
4	21.92	11.73	9.50	DS C AF
5	13.67	5.91	7.40	CDS A F
14	9.89	8.49		CFS AD
16	10.41	7.86		CDFS A
18	18.40	18.33		CS ADF
22	5.66	3.87		CDFS A
25	8.21	4.10	4.15	C D AFS
60	22.58	13.41	8.94	CDS F A
76	13.55	12.86		CD AFS
1	0.90			No pattern of change
7	3.42			.. ..
8	3.85			.. ..
9	4.30			.. ..
29	7.50			.. ..

16. EFT v Modifications.

TABLE 16

EFT v Modifications

EFT v MOD1

Tune no.	F	Signif.	Compared with overall mean: Higher mean	Lower mean
4	4.32	0.04		x
12	8.36	0.004		x
13	4.49	0.04		x
24	3.96	0.05		x
51	4.95	0.03	x	

EFT v MOD2

Tune no.	F	Signif.	Compared with overall mean: Higher mean	Lower mean
5	3.90	0.05		x
7	3.81	0.05	x	
17	5.27	0.02		x
20	6.99	0.009	x	
22	9.15	0.003		x
29	4.75	0.03	x	
31	4.53	0.03		x
64	5.67	0.02	x	

EFT v MOD3

Tune no.	F	Signif.	Compared with overall mean: Higher mean	Lower mean
15	5.84	0.02		x
23	4.10	0.04	x	
66	3.95	0.05		x

17.1. EFT v Categorization

by "O"; by MOD 1.

TABLE 17.1

EFT v Categorization

EFT v "0"

Tune no.	F	Signif.	Categorized as: A	C	D	F	S
14	2.81	0.03	x				
20	4.34	0.002			x		
21	3.42	0.01					x
24	2.33	0.05		x			
29	2.92	0.02				x	
49	2.70	0.03					x
61	2.34	0.05				x	
66	3.08	0.02		x			
72	2.65	0.04	x				
74	2.45	0.05			x		

EFT v MOD1

Tune no.	F	Signif.	Categorized as: A	C	D	F	S
12	5.41	0.0004	x				
18	2.79	0.03			x		
37	2.47	0.05				x	
41	2.78	0.03					x
49	2.63	0.04					x
66	3.56	0.008		x			
67	2.55	0.04					x
80	2.50	0.04				x	

17.2. EFT v Categorization

by MOD 2; by MOD 3.

TABLE 17.2 (concl'd)

EFT v MOD2

Tune no.	F	Signif.	Categorized as: A	C	D	F	S
7	5.40	0.0004	x				
9	2.52	0.04	x				
43	2.53	0.04				x	
51	2.32	0.05	x				
62	2.35	0.05			x		
63	2.37	0.05	x				

EFT v MOD3

Tune no.	F	Signif.	Categorized as: A	C	D	F	S
8	2.47	0.05			x		
14	2.51	0.04	x				
15	3.56	0.008			x		
20	4.73	0.001		x			
26	4.01	0.004				x	
27	3.41	0.01	x				
33	3.12	0.02	x				
34	2.54	0.04	x				
35	2.69	0.03		x			
43	5.81	0.0002		x			
51	2.68	0.03		x			
61	2.89	0.02			x		
66	3.04	0.02		x			
70	3.75	0.006				x	

18. Frequencies of ambiguity/unambiguity preferences.

A2B PREFERRED

	Ambiguous					Unambiguous				
	71	84	107	124	163	49	69	75	105	129
71						10	19	22	9	9
84						13	14	8	14	11
107						18	19	20	8	18
124						5	18	19	9	7
163						11	14	15	7	18
49	17	14	13	22	16					
69	10	17	10	9	12					
75	5	23	6	7	11					
105	17	17	18	17	24					
129	18	15	11	24	8					

	71	84	107	124	163	49	69	75	105	129
71						0	1	1•	0	0
84						0	0	0	0	0
107						1	1	1•	0	1
124						0	1	1•	0	0
163						0	1	1	0	1•
49	1	1	0	1•	1					
69	0	1	0	0	0					
75	0	1•	0	0	0					
105	1	1	1•	1	1•					
129	1	1	0	1•	0					

A2G PREFERRED

	Ambiguous					Unambiguous				
	71	84	107	124	163	49	69	75	105	129
71						11	5	11	7	19
84						10	17	9	14	7
107						19	13	11	21	14
124						12	12	10	12	4
163						8	4	4	5	12
49	18	20	10	18	21					
69	23	16	18	10	26					
75	21	21	19	20	26					
105	21	15	9	18	26					
129	10	22	16	27	18					

	71	84	107	124	163	49	69	75	105	129
71						0	0	0	0	1
84						0	1	0	0	1•
107						1	0	0	1•	0
124						0	0	0	0	0
163						0	0	0	0	0
49	1	1	0	1	1•					
69	1•	0	1	1	1•					
75	1	1•	1	1	1•					
105	1•	1	0	1	1•					
129	0	1	1	1•	1					

A4B PREFERRED

	Ambiguous					Unambiguous				
	71	84	107	124	163	49	69	75	105	129
71						7	14	19	13	28
84						7	17	13	17	8
107						15	5	22	23	12
124						14	17	17	12	2
163						5	6	10	3	10
49	23	21	15	16	25					
69	16	13	26	14	25					
75	12	14	9	14	18					
105	16	13	8	19	28					
129	2	22	19	29	21					

	71	84	107	124	163	49	69	75	105	129
71						0	0	1	0	1•
84						0	1	0	1	0
107						=	0	1•	1•	0
124						0	1	1	0	0
163						0	0	0	0	0
49	1•	1•	=	1	1•					
69	1	0	1•	0	1•					
75	0	1	0	0	1					
105	1	0	0	1	1•					
129	0	1•	1	1•	1•					

A4G PREFERRED

	Ambiguous					Unambiguous				
	71	84	107	124	163	49	69	75	105	129
71						17	14	19	11	27
84						12	14	13	22	8
107						20	12	30	25	16
124						16	19	12	12	4
163						8	9	13	5	13
49	20	26	17	21	29					
69	23	23	25	17	28					
75	16	25	7	25	25					
105	26	15	12	25	32					
129	10	29	21	33	24					

	71	84	107	124	163	49	69	75	105	129
71						0	0	1	0	1•
84						0	0	0	1	0
107						1	0	1•	1•	0
124						0	1	0	0	0
163						0	0	0	0	0
49	1	1•	0	1	1•					
69	1	1	1•	0	1•					
75	0	1	0	1•	1					
105	1•	0	0	1•	1•					
129	0	1•	1	1•	1					

C2B PREFERRED

AMbiguous					Unambiguous				
	46	94	145	151	181	15	34	35	136	200
46						21	24	6	16	29
94						21	17	15	16	16
145						11	23	17	8	14
151						16	5	8	10	22
181						18	26	8	15	18
15	5	5	16	13	11					
34	7	14	8	21	5					
35	21	16	12	19	18					
136	13	10	23	21	16					
200	2	15	13	8	8					

	46	94	145	151	181	15	34	35	136	200
46						1•	1•	0	1	1•
94						1•	1	0	1	1
145						0	1•	1	0	1
151						1	0	0	0	1•
181						1	1•	0	0	1•
15	0	0	1	0	0					
34	0	0	0	1•	0					
35	1•	1	0	1•	1•					
136	0	0	1•	1•	1					
200	0	0	0	0	0					

C2G

PREFERRED

	Ambiguous					Unambiguous				
	46	94	145	151	181	15	34	35	136	200
46						12	20	10	6	23
94						20	23	10	18	14
145						18	24	15	15	22
151						4	20	4	4	21
181						13	23	11	9	10
15	18	10	11	26	17					
34	12	9	8	18	9					
35	19	21	15	25	18					
136	24	12	17	27	23					
200	9	18	7	11	20					

	46	94	145	151	181	15	34	35	136	200
46						0	1	0	0	1•
94						1•	1•	0	1	0
145						1	1•	=	0	1•
151						0	1	0	0	1
181						0	1•	0	0	0
15	1	0	0	1•	1					
34	0	0	0	0	0					
35	1	1•	=	1•	1					
136	1•	0	1	1•	1•					
200	0	1	0	0	1					

C4B PREFERRED

	Ambiguous					Unambiguous				
	46	94	145	151	181	15	34	35	136	200
46						24	24	9	12	28
94						22	23	13	25	19
145						16	24	15	10	19
151						10	5	7	4	21
181						17	27	16	12	26
15	6	9	14	17	11					
34	7	8	7	26	4					
35	21	8	13	23	14					
136	16	6	21	27	19					
200	3	11	11	10	5					

	46	94	145	151	181	15	34	35	136	200
46						1•	1•	0	0	1•
94						1•	1•	1	1•	1
145						1	1•	1	0	1
151						0	0	0	0	1•
181						1	1•	0	0	1•
15	0	0	0	1	0					
34	0	0	0	1•	0					
35	1•	0	0	1•	0					
136	1	0	1•	1•	1					
200	0	0	1	0	0					

C4G

PREFERRED

	Ambiguous					Unambiguous				
	46	94	145	151	181	15	34	35	136	200
46						31	33	12	14	34
94						18	27	13	17	19
145						19	22	19	11	25
151						12	9	8	11	20
181						28	30	8	13	24
15	5	15	18	26	10					
34	4	10	14	27	7					
35	25	4	19	29	29					
136	24	19	26	26	24					
200	3	18	12	17	12					

	46	94	145	151	181	15	34	35	136	200
46						1•	1•	0	0	1•
94						1	1•	1•	0	1
145						1	1	=	0	1•
151						0	0	0	0	1
181						1•	1•	0	0	1•
15	0	0	0	1•	0					
34	0	0	0	1•	0					
35	1•	0	=	1•	1•					
136	1	1	1•	1•	1					
200	0	0	0	0	0					

D2B PREFERRED

	Ambiguous					Unambiguous				
	31	67	116	157	193	65	110	142	154	175
31						12	9	9	7	18
67						16	17	12	11	17
116						8	24	18	17	17
157						16	25	16	15	15
193						18	17	11	10	24
65	16	10	18	13	9					
110	15	12	5	6	12					
142	18	13	9	11	16					
154	20	15	9	14	18					
175	9	14	10	14	7					

	31	67	116	157	193	65	110	142	154	175
31						0	0	0	0	1
67						1	1	0	0	1
116						0	1•	1	1	1
157						1	1•	1	1	1
193						1	1	0	0	1•
65	1	0	1•	0	0					
110	1	0	0	0	0					
142	1	1	0	0	1					
154	1•	1	0	0	1					
175	0	0	0	0	0					

D2G PREFERRED

	Ambiguous					Unambiguous				
	31	67	116	157	193	65	110	142	154	175
31						18	12	13	16	20
67						13	8	14	12	16
116						15	19	23	24	22
157						14	24	21	19	23
193						21	19	17	7	19
65	12	16	15	16	9					
110	18	22	11	8	11					
142	16	16	6	8	13					
154	13	18	5	11	23					
175	9	16	6	7	13					

	31	67	116	157	193	65	110	142	154	175
31						1	0	0	1	1•
67						0	0	0	0	=
116						=	1	1•	1•	1•
157						0	1•	1•	1	1•
193						1•	1	1	0	1
65	0	1	=	1	0					
110	1	1•	0	0	0					
142	1	1	0	0	0					
154	0	1	0	0	1•					
175	0	=	0	0	0					

D4B

PREFERRED

	Ambiguous					Unambiguous				
	31	67	116	157	193	65	110	142	154	175
31						7	13	7	10	17
67						18	6	14	10	27
116						9	24	25	23	25
157						14	28	15	11	16
193						23	8	14	14	28
65	21	11	22	14	8					
110	17	22	4	3	20					
142	23	17	5	15	17					
154	20	21	7	17	14					
175	13	4	5	12	3					

	31	67	116	157	193	65	110	142	154	175
31						0	0	0	0	1
67						1	0	0	0	1•
116						0	1•	1•	1•	1•
157						=	1•	=	0	1
193						1•	0	0	=	1•
65	1•	0	1•	=	0					
110	1	1•	0	0	1•					
142	1•	1	0	=	1					
154	1	1•	0	1	=					
175	0	0	0	0	0					

D4G

PREFERRED

	Ambiguous					Unambiguous				
	31	67	116	157	193	65	110	142	154	175
31						28	14	16	20	27
67						26	11	12	10	32
116						15	32	35	25	30
157						16	31	18	18	12
193						34	20	21	13	31
65	10	11	22	20	3					
110	23	27	6	6	18					
142	21	25	2	19	16					
154	17	27	12	19	25					
175	10	5	7	26	6					

	31	67	116	157	193	65	110	142	154	175
31						1•	0	0	1	1•
67						1•	0	0	0	1•
116						0	1•	1•	1•	1•
157						0	1•	0	0	0
193						1	1	1	0	1•
65	0	0	1	1	0					
110	1	1•	0	0	0					
142	1	1•	0	1	0					
154	0	1•	0	1	1					
175	0	0	0	1•	0					

F2B PREFERRED

	Ambiguous					Unambiguous				
	37	64	72	80	100	76	90	99	121	134
37						6	19	21	13	9
64						13	13	7	15	7
72						13	20	13	18	14
80						14	21	19	13	11
100						8	15	16	13	17
76	20	18	14	12	19					
90	8	12	9	10	14					
99	8	19	13	8	13					
121	18	15	13	13	18					
134	18	19	15	14	12					

	37	64	72	80	100	76	90	99	121	134
37						0	1•	1•	0	0
64						0	1	0	=	0
72						0	1•	=	1	0
80						1	1•	1•	=	1
100						0	1	1	0	1
76	1•	1	1	0	1•					
90	0	0	0	0	0					
99	0	1•	=	0	0					
121	1	=	0	=	1					
134	1	1•	1	0	0					

F2G PREFERRED

	Ambiguous					Unambiguous				
	37	64	72	80	100	76	90	99	121	134
37						10	18	17	13	16
64						11	14	17	11	10
72						16	14	23	13	5
80						23	16	22	17	13
100						7	12	11	15	9
76	20	21	13	7	22					
90	11	16	16	16	18					
99	13	13	7	7	19					
121	19	18	19	12	17					
134	13	20	25	16	21					

	37	64	72	80	100	76	90	99	121	134
37						0	1	1	0	1
64						0	0	1	0	0
72						1	0	1	0	0
80						1	=	1	1	0
100						0	0	0	0	0
76	1	1	0	0	1					
90	0	1	1	=	1					
99	0	0	0	0	1					
121	1	1	1	0	1					
134	0	1	1	1	1					

F4B

PREFERRED

	Ambiguous					Unambiguous				
	37	64	72	80	100	76	90	99	121	134
37						11	19	21	16	10
64						18	16	14	17	14
72						14	16	17	28	17
80						21	15	18	18	16
100						8	11	19	13	14
76	20	13	16	10	22					
90	11	15	11	16	17					
99	7	17	14	12	9					
121	15	14	3	13	18					
134	20	17	11	15	14					

	37	64	72	80	100	76	90	99	121	134
37						0	1	1•	1	0
64						1	1	0	1	0
72						0	1	1	1•	1
80						1•	0	1	1	1
100						0	0	1•	0	=
76	1	0	1	0	1•					
90	0	0	0	1	1					
99	0	1	0	0	0					
121	0	0	0	0	1					
134	1	1	0	0	=					

F4G PREFERRED

	Ambiguous					Unambiguous				
	37	64	72	80	100	76	90	99	121	134
37						17	20	19	17	18
64						16	16	11	16	13
72						21	15	20	27	12
80						20	28	20	20	14
100						13	15	20	16	22
76	20	21	16	17	24					
90	17	21	23	9	23					
99	18	26	17	17	18					
121	20	20	10	16	21					
134	19	23	25	22	16					

	37	64	72	80	100	76	90	99	121	134
37						0	1	1	0	0
64						0	0	0	0	0
72						1	0	1	1•	0
80						1	1•	1	1	=
100						0	0	1	0	1
76	1	1	0	0	1					
90	0	1	1	0	1					
99	0	1•	0	0	0					
121	1	1	0	0	1					
134	1	1	1•	=	0					

S2B

PREFERRED

	Ambiguous					Unambiguous				
	13	14	62	135	155	78	123	173	187	192
13						10	16	8	7	12
14						4	9	12	9	6
62						9	13	11	6	9
135						6	14	15	15	14
155						14	9	13	7	13
78	21	23	18	20	13					
123	11	16	15	17	17					
172	17	15	20	16	13					
187	21	17	21	16	24					
192	13	20	22	13	14					

	13	14	62	135	155	78	123	173	187	192
13						0	1	0	0	0
14						0	0	0	0	0
62						0	0	0	0	0
135						0	0	0	0	1
155						1	0	=	0	0
78	1•	1•	1	1•	0					
123	0	1	1	1	1					
173	1	1	1	1	=					
187	1•	1	1•	1	1•					
192	1	1•	1•	0	1					

S2G

PREFERRED

	Ambiguous					Unambiguous				
	13	14	62	135	155	78	123	173	187	192
13						11	14	12	7	12
14						11	17	20	17	12
62						16	16	12	9	10
135						13	16	16	14	9
155						19	12	21	13	12
78	21	18	13	17	10					
123	15	13	14	15	18					
173	17	9	20	16	8					
187	23	13	20	18	19					
192	18	18	22	20	17					

	13	14	62	135	155	78	123	173	187	192
13						0	0	0	0	0
14						0	1	1•	1	0
62						1	1	0	0	0
135						0	1	=	0	0
155						1	0	1•	0	0
78	1	1	0	1	0					
123	1	0	0	0	1					
173	1	0	1	=	0					
187	1•	0	1•	1	1					
192	1	1	1•	1•	1					

S4B

PREFERRED

	Ambiguous					Unambiguous				
	13	14	62	135	155	78	123	173	187	192
13						7	10	9	5	9
14						9	12	12	9	6
62						8	15	7	4	4
135						14	9	13	6	9
155						17	13	17	1	9
78	24	21	22	16	13					
123	20	19	12	22	17					
173	19	18	24	18	13					
187	23	22	26	25	30					
192	22	25	27	21	21					

	13	14	62	135	155	78	123	173	187	192
13						0	0	0	0	0
14						0	0	0	0	0
62						0	1	0	0	0
135						0	0	0	0	0
155						1	0	1	0	0
78	1•	1•	1•	1	0					
123	1	1	0	1•	1					
173	1	1	1•	1	0					
187	1•	1•	1•	1•	1•					
192	1•	1•	1•	1•	1•					

S4G PREFERRED

	Ambiguous					Unambiguous				
	13	14	62	135	155	78	123	173	187	192
13						8	13	6	15	6
14						11	15	17	15	8
62						12	13	7	8	4
135						16	17	23	8	15
155						24	16	22	5	16
78	28	26	25	21	13					
123	23	22	25	20	20					
173	29	19	30	14	14					
187	23	21	29	29	32					
192	31	29	33	22	21					

	13	14	62	135	155	78	123	173	187	192
13						0	0	0	0	0
14						0	0	0	0	0
62						0	0	0	0	0
135						0	0	1	0	0
155						1•	0	1	0	0
78	1•	1•	1•	1	0					
123	1	1	1	1	1					
173	1•	1	1•	0	0					
187	1	1	1•	1•	1•					
192	1•	1•	1•	1	1					

19. Summary of preference frequencies.

	Ambiguous						Unambiguous					
	71	84	107	124	163	Totals	49	69	75	105	129	Totals
A2B	-	1	1	2	1	5	-	-	3	-	1	4
A2G	2	1	-	1	4	8	-	-	-	1	1	2
A4B	1	2	1	1	4	9	-	-	1	1	1	3
A4G	1	2	1	3	3	10	-	-	1	1	1	3
Totals	4	6	3	7	12	32	-	-	5	3	4	12

	Ambiguous						Unambiguous					
	46	94	145	151	181	Totals	15	34	35	136	200	Totals
C2B	1	–	1	3	1	6	2	3	–	–	3	8
C2G	1	1	–	3	1	6	1	3	–	–	2	6
C4B	1	–	1	3	–	5	2	4	–	1	3	10
C4G	1	–	1	4	1	7	2	3	1	–	3	9
Totals	4	1	3	13	3	24	7	13	1	1	11	33

	Ambiguous						Unambiguous					
	31	67	116	157	193	Totals	65	110	142	154	175	Totals
D2B	1	–	1	–	–	2	–	2	–	–	1	3
D2G	–	1	–	–	1	2	1	1	2	1	3	8
D4B	2	2	1	–	1	6	1	2	1	1	3	8
D4G	–	3	–	1	–	4	2	2	1	1	4	10
Totals	3	6	2	1	2	14	4	7	4	3	11	29

	Ambiguous						Unambiguous					
	37	64	72	80	100	Totals	76	90	99	121	134	Totals
F2B	1	2	-	-	1	4	-	3	2	-	-	5
F2G	-	-	1	-	2	3	1	-	2	-	-	3
F4B	-	-	-	-	1	1	1	-	2	1	-	4
F4G	-	1	1	-	-	2	-	1	-	1	-	2
Totals	1	3	2	-	4	10	2	4	6	2	-	14

	Ambiguous						Unambiguous					
	13	14	62	135	155	Totals	78	123	173	187	192	Totals
S2B	2	2	2	1	1	8	-	-	-	-	-	0
S2G	1	-	2	1	-	4	-	-	2	-	-	2
S4B	3	3	4	3	2	15	-	-	-	-	-	0
S4G	3	2	4	1	1	11	1	-	-	-	-	1
Totals	9	7	12	6	4	38	1	-	2	-	-	3

20. Preference decisions, ambiguity/unambiguity.

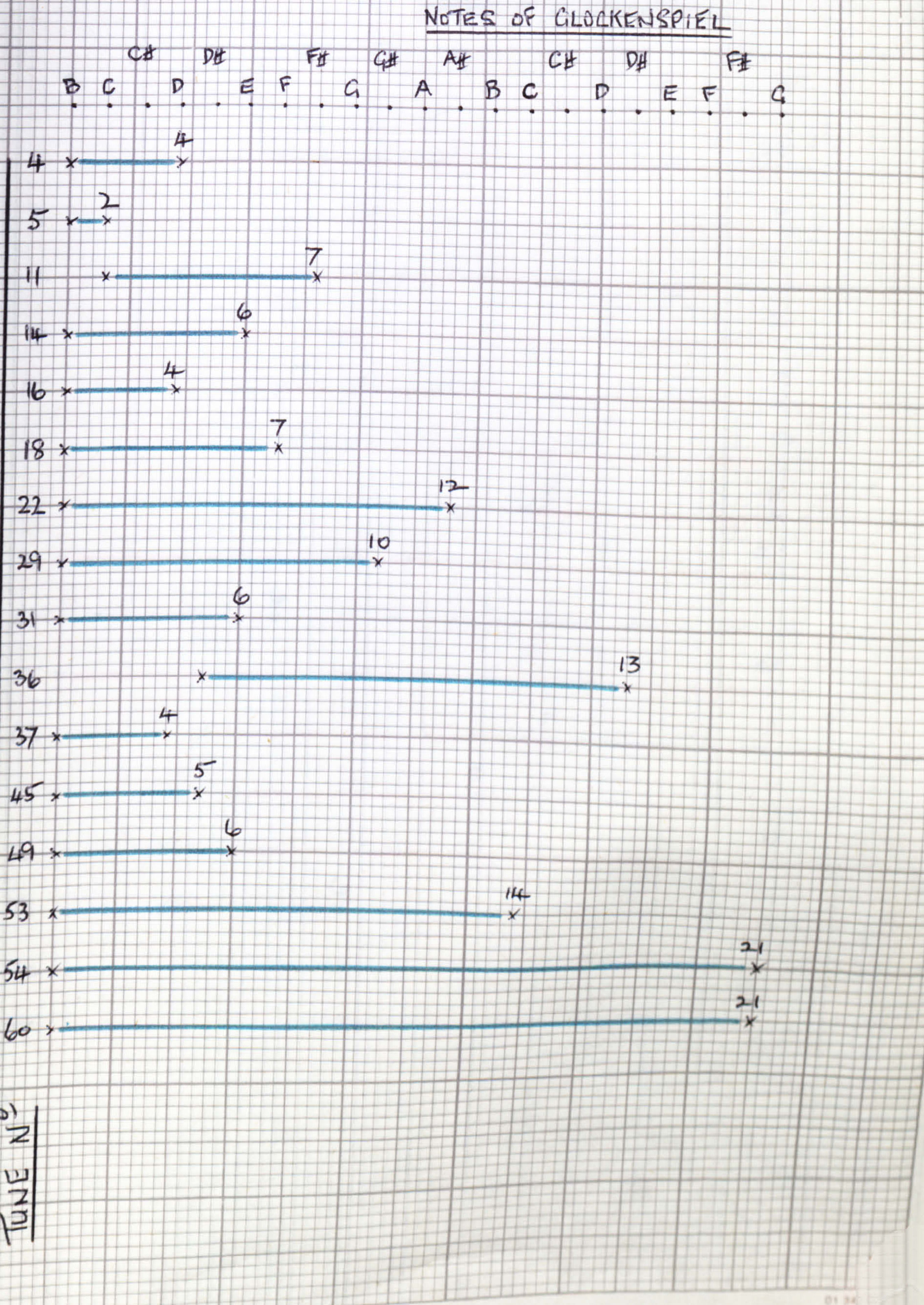
	Ambiguous	Unambiguous	Decision to accept as different.
A2B	5	4	No
2G	8	2	Yes
4B	9	3	Yes
4G	10	33	Yes
C2B	6	8	No
2G	6	6	No
4B	5	10	Yes
4G	7	9	No
D2B	2	3	No
2G	2	8	Yes
4B	6	8	No
4G	4	10	Yes
F2B	4	5	No
2G	3	3	No
4B	1	4	Yes
4G	2	2	No
S2B	8	0	Yes
2G	4	2	Yes
4B	15	0	Yes
4G	11	1	Yes

21. Pitch and Range Graphs.

The number at the right-hand end of each range line gives that tune's range in semi-tones.

PITCH AND RANGE "ANGRY"

S.D. = 5.56



PITCH AND RANGE "COMICAL"

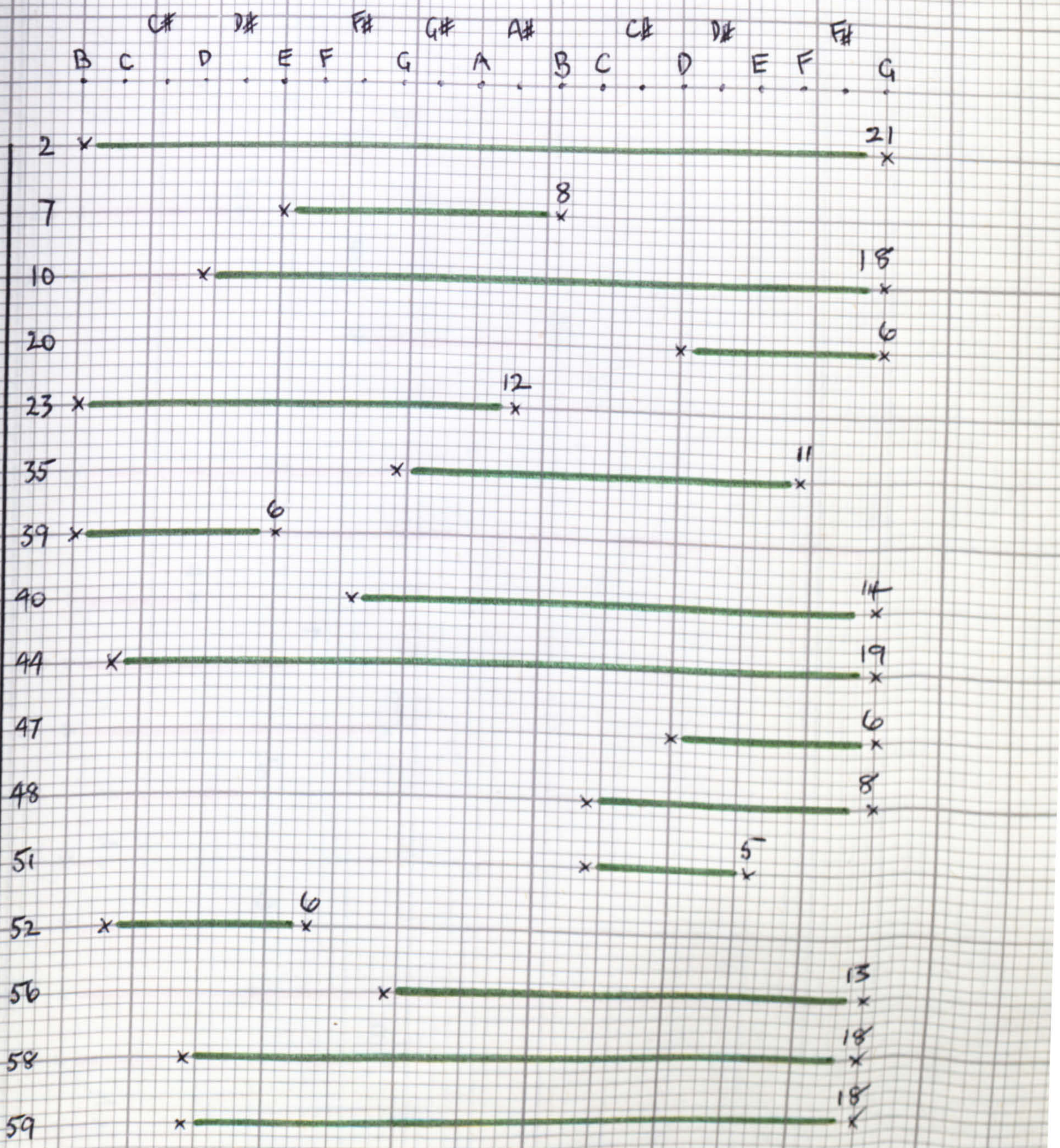
S.D. = 12·13

NOTES OF GLOCKENSPIEL

PITCH AND RANGE "DREAMY"

S.D. = 10.72

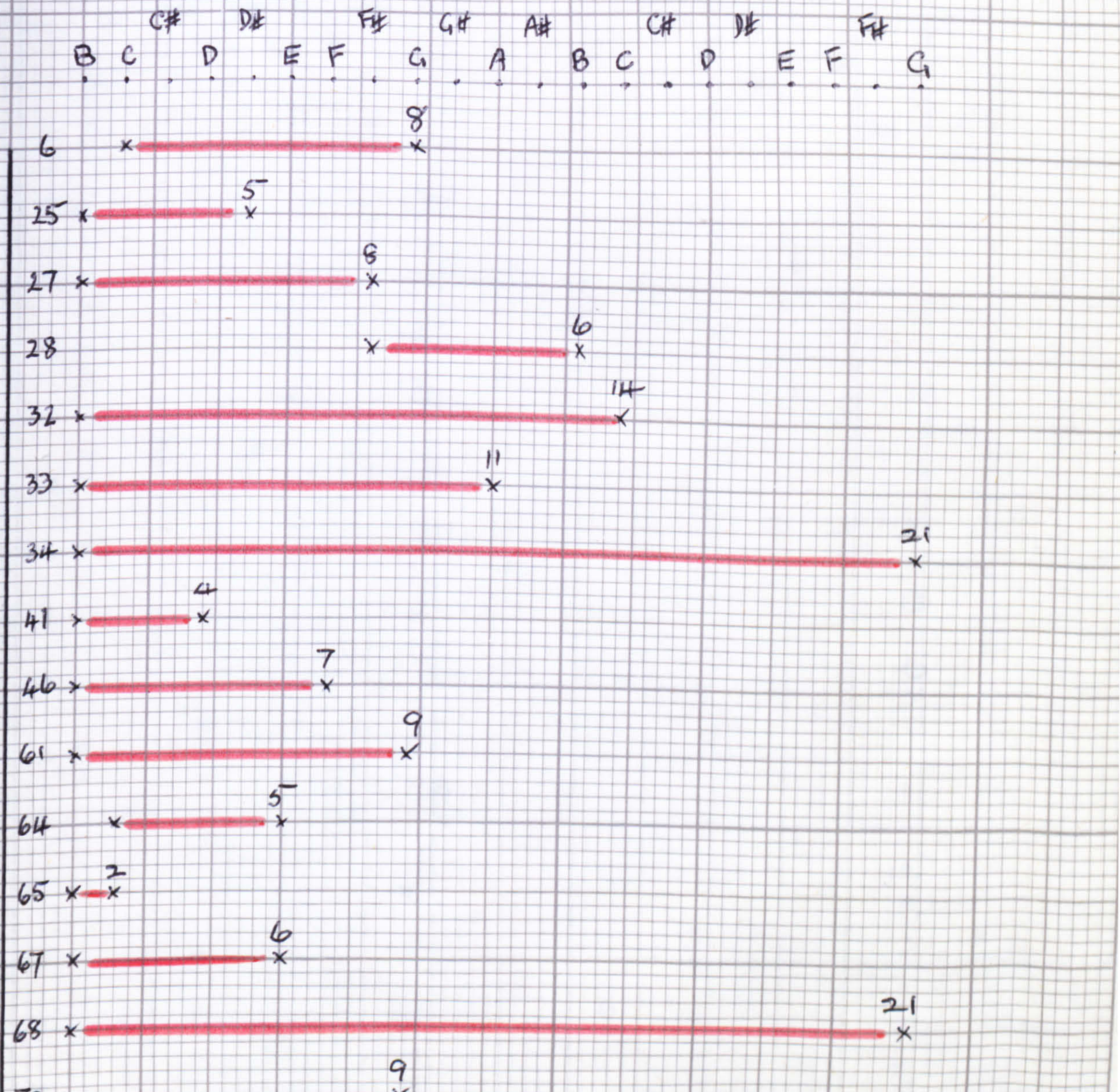
NOTES OF GLOCKENSPIEL



PITCH AND RANGE "FRIGHTENED"

S.D = 8.30

NOTES OF GLOCKENSPIEL



PITCH AND RANGE "SAD"

S.D. = 9.36

NOTES OF GLOCKENSPIEL

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